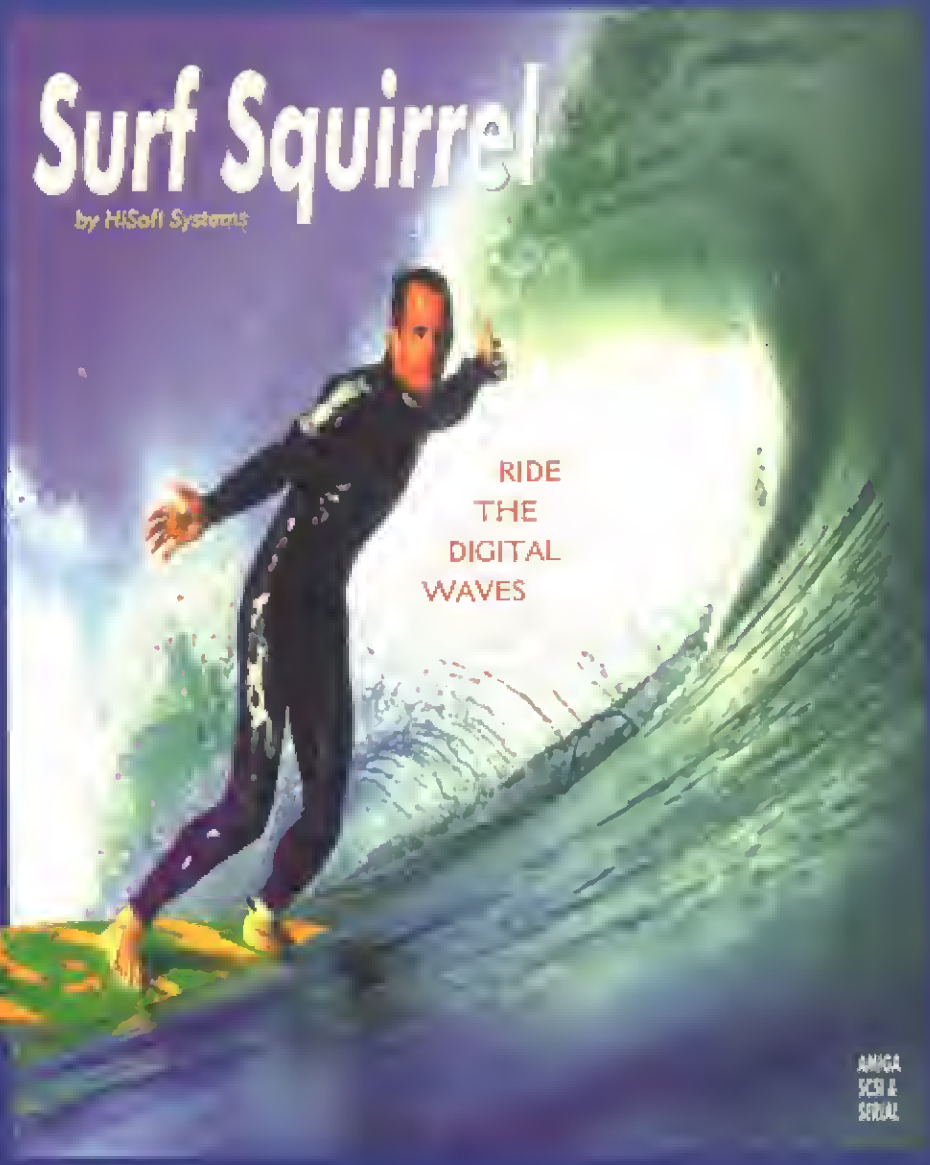
HiSoft SYSTEMS

Surf Squirrel

by HiSoft Systems



User Manual

Surf Squirrel™ Interface for the Amiga

By [redacted]

[redacted]

Published by HiSoft

HiSoft
SYSTEMS

The Old School, Greenfield
Bedford MK45 5DE UK
Tel: +44 (0) 1525 718181
Fax: +44 (0) 1525 713716

First Edition, April 1996

Table of Contents

Introduction 1

- Unpacking your Surf Squirrel 2
- System Requirements 2
- Making a Backup Disk 3
- Registration Card 3
- The ReadMe file 3
- Background Information on SCSI 4
  - What is SCSI? 4
  - SCSI-1 against SCSI-2 5
  - SCSI Cabling 6
  - SCSI Termination 7
  - SCSI ID Numbers 8
- Background Information on Serial 9
  - What's bps? 9
  - OK, but what's a serial port? 10
  - Speaking of cables... 10
  - About modems... 11

Setting up Surf Squirrel 15

- Using your Surf Squirrel Interface 15
  - Installing the Hardware 15
  - Attaching SCSI Peripherals 16
  - Installing the Surf Squirrel Software 16

Working With Your New SCSI Peripheral 21
Fixed Media Hard Drives 22
Removable Media Drives 23
CD-ROMs 24
Tape Drives, Scanners and Printers 24
Attaching a Modem 25
Preparing a Hard Disk with HDToolBox 27
Preparing a New Hard Drive 27
Starting HDToolbox 28
For All Actions in HDToolbox 29
Changing the Drive Type 30
Partitioning a Hard Drive 34
Using the Partitioning Window 35
Mapping Bad Blocks 39
Locating Bad Blocks 40
Using Verify Data on Drive 40
Adding a Bad Block to the Bad Blocks List 42
Low-Level Formatting 43
Modifying File System Options 44
File System Maintenance 47
Adding a New File System 48
Deleting a File System 48
Updating an Existing File System 49

Using the CD32 Emulator 51
Setting the language 52
The Title... Drawers 52
The Presets Drawer 53
Appendix A Mount Files 55
Example Mount File and ToolTypes 58
Mount Lists 59
Appendix B The Supplied Software 63
Files in System Drawers 63
The Devs Drawer 63
The Devs/DOSDrivers drawer 64
The L drawer 65
The Libs Drawer 65
The C Drawer 66
The ENVARC: drawer 66
The S Drawer 67
CD32-Startup 67
Files in the CD32 Drawer 67
The CD32:C Drawer 68
Extra Software 71
Appendix C Fast Serial Pinout 73
Appendix D Technical Support 74

Surf Squirrel™

Introduction

Thank you for purchasing our Surf Squirrel interface for the Amiga A1200 computer. With this interface and software you can now attach up to 7 different SCSI peripherals (CD-ROM, Hard drive, Scanner, Magneto Optical, Zip/Jaz, SyQuest etc.) to your computer and have access to all of these devices as and when you want. You can also use the Surf Squirrel's fast, hardware serial port to attach a modem, communicate with other serial devices or even network computers together. The essential features of the Surf Squirrel are:

- Advanced SCSI 2 interface allowing transfer speeds of up to 2.6Mb/s on a suitably-equipped A1200.
- Complete SCSI software for hard drives, CD-ROMs etc.
- CD32 and CDTV emulation software.
- Ability to auto-boot from a SCSI external hard drive with only a one-time boot from floppy at power-on.
- Fast hardware serial port allowing speeds of up to 230,400bps.
- Full serial software supporting the RTS/CTS and XON/XOFF protocols.
- Quick and easy installation which does not invalidate your Amiga's warranty.

Please take some time to read at least this first chapter of the manual before you use the Surf Squirrel interface. We have included some useful background information on SCSI and serial devices together with some essential advice on setting up your SCSI chain, so a little time spent now will be a worthwhile investment.

First things first though; let's check your package, check out some essentials and fill out your registration card.

Unpacking your Surf Squirrel

Within your Surf Squirrel package you should have:

- A black Surf Squirrel interface with SCSI cable, 9-pin serial port and a socket for connection to the PCMCIA slot of your A1200.
- The Surf Squirrel software on floppy disk(s).
- This manual.
- A registration card.

There may also be some extra information on further products that you can use with your Surf Squirrel.

Please check that you have at least the items listed above and that they are in good condition. If any appear damaged or are missing please contact your supplier as quickly as possible.

System Requirements

Surf Squirrel *requires* the following equipment:

- An Amiga A1200 computer.
- Workbench™ 3.0 and above.
- 2Mb of memory and one floppy disk drive.

We *recommend* the following to facilitate the use of the Surf Squirrel:

- More memory; the more Fast RAM that you have in your A1200, the more programs that you will be able to run at once, the faster these programs will run (probably) and the fewer error messages that will appear.
- A hard disk; an internal IDE hard disk or an external SCSI hard disk will speed up and ease the boot process and generally make your computer much easier to use.
- An accelerator; a processor accelerator will make your A1200 run much more quickly and efficiently.

Making a Backup Disk

Before installing and running the Surf Squirrel software, it is essential to make *backup disk(s)* from your *master disk(s)*.

To do this you need to format one or more blank floppy disks and copy the Surf Squirrel master disk(s). Do this using the Workbench `Format/Copy` commands, the CLI or your favourite disk copying program.

Using backup disk(s) means that you can keep your master disk(s) safe from accidental damage and make a new backup should copies become damaged; so once you have made a copy, lock up your original Surf Squirrel disk(s) away from heat, electrical interference and spilt coffee!

Registration Card

Enclosed with this package is a registration card which you should fill in and return to us in order to register your purchase of Surf Squirrel. This will entitle you to a free period of technical support and will enable us to keep you informed of future developments to our products. For details of our technical support services, please refer to the back of this manual.

You will need to quote your serial number (found on the first master disk label) to obtain technical support. You may find it useful to make a note of it here:

Serial No:

The ReadMe file

As with all HiSoft products, Surf Squirrel is being improved and updated continually and the latest details may be found in the `ReadMe` file on the first program disk. It is important that you read this to find out about any new features or corrections to the manual.

You can look at the `ReadMe` file by double-clicking on its icon from the Workbench™ and following the instructions.

Background Information on SCSI

We now present some background information on the SCSI standard and serial devices, followed by advice on fitting your Surf Squirrel interface and setting up the necessary software and ancillary peripherals. In the remaining chapters of the manual we will cover the software in more depth; you will want to read this if you experience any problems or have special requirements.

What is SCSI?

SCSI is an acronym for *Small Computer System Interface* and is pronounced "scuzzy". In theory SCSI is a set of standards defining a protocol for connecting different hardware devices together and attaching them to a computer fitted with a suitable SCSI interface. The American National Standards Institute (ANSI) published the first document defining the SCSI-1 standard in 1986 and, at that time, a committee was already hard at work extending the standard to a level which is known as SCSI-2 - now they are beavering away on SCSI-3!

The mere fact that, within a period of 10 years, this protocol has had two formal standards defined with a third in progress, shows the impact and importance of SCSI - although designed for small computers, it is nothing but small itself.

So what does SCSI do for you, in practice? Well, given a SCSI interface attached to or built in to your computer, you can then connect up to 7 other SCSI peripherals, or *devices* - these can be hard disks, tape drives, DAT drives, CD-ROMs, Iomega Zip/Jaz or SyQuest removables, Magneto Opticals, Scanners etc. All devices may be 'daisy-chained' together using suitable cables and each peripheral has its own identification number so that the computer can address each one as necessary to allow all devices to 'talk' to each other.

In addition, the SCSI standard specifies fast data transfer rates; theoretically up to 40Mb per second for SCSI-2 using the right chips and cabling although, currently, very few devices support this level of data transfer and your humble A1200 certainly can't cope with this sort of speed. However, the important point is that SCSI is a professional standard designed for speed, versatility and expansion - something that you simply cannot ignore if you are serious about storage.

SCSI-1 against SCSI-2

As we have said, SCSI-1 was finalised in 1986 and the work on SCSI-2 was started in the same year. The original motivation for the newer standard came from a group of hardware manufacturers who wanted to extend the specifications to allow them to build more powerful, faster devices and they approached the ANSI committee before it had finished work on SCSI-1. Rather than delay the first standard, the committee published SCSI-1 and immediately set about SCSI-2.

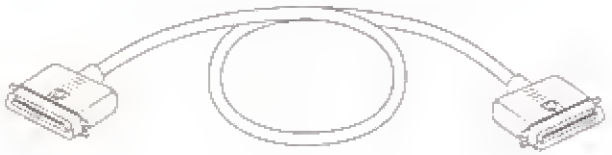
The end result is a new definition which seeks to remove certain restrictive options, add more requirements and allow new options and commands to improve the speed and power of SCSI whilst retaining compatibility with existing SCSI chips.

As a user of the Surf Squirrel, you have a product which supports all of the requirements of SCSI-2 and therefore you should find that all SCSI-1 and SCSI-2 devices will work satisfactorily; however, it is always possible that there may be certain devices which do not conform to the standards so, if you discover any problems, please let us know (see the ***Technical Support*** Appendix).

The Surf Squirrel interface is not Fast-SCSI or Wide-SCSI (which would be considerably more expensive) but it still manages to attain very reasonable data transfer speeds (over 1.2Mb/sec sustained on an un-expanded A1200 and up to 2.6Mb/sec on an accelerated A1200) and therefore provides excellent value for money.

SCSI Cabling

Your Surf Squirrel interface is supplied with a standard 50-way Amphenol connector, suitable for attachment directly to any SCSI device with a compatible socket. Peripherals designed for the PC or Macintosh™ market have two 50-way sockets at the rear of the casing, allowing for daisy-chaining; you can plug the Squirrel connector into *either* of these. You may find some cases with Micro-D connectors, popular in the Workstation marketplace; it is possible to purchase converters for this type of connector but you would be safer with 50-way Amphenols.



a SCSI cable

If you are going to use more than one SCSI device with the Surf Squirrel, you will need to purchase one or more SCSI peripheral cables, which are 50-way to 50-way, in various lengths; it is worth investing in quality, well-shielded and moulded cables to minimise any noise problems that may occur. It is also best to use short cables where possible.

Note that the total length of SCSI cabling in your set-up should not exceed 6m (about 20 feet); in practice this should not cause a problem!

Certain peripherals may have 25-way 'D-type' sockets (the Apple Macintosh™ SCSI uses 25-way connectors) but all should have at least one 50-way socket. Most *Squirrel Storage Systems* external SCSI devices are fitted with twin 50-way Amphenol sockets, SCSI ID switch and phono sockets, where appropriate.

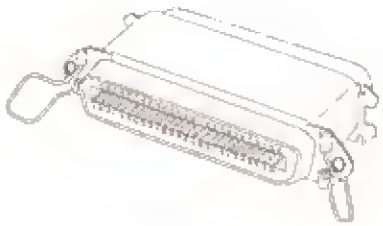
SCSI Termination

This is probably the most difficult and the most discussed aspect of SCSI.

The theory behind termination results from the fact that, whenever you have an electrical signal travelling along a chain of cables, the signal can 'bounce back' when it reaches the physical end of the chain, thus causing interference (noise) with the original signal. Fitting termination resistor packs at each end of the SCSI chain cuts down this signal reflection and therefore improves signal quality.

Some SCSI devices may be terminated internally (refer to the user manual if in doubt) and these terminators will usually be small packs of black plastic plugged into the circuit board.

You can also buy external terminators which plug into the 50-way connector on the outside of the peripheral casing.



An external terminator

The basic rule is that each end of the SCSI chain should be terminated and there should be no termination in between.

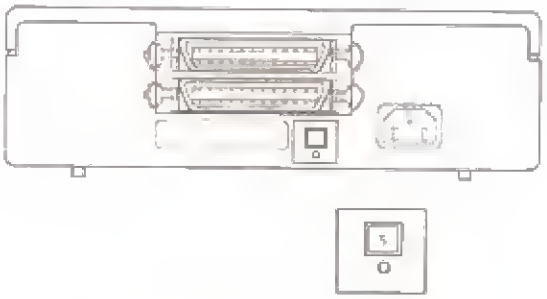
The Surf Squirrel interface is fitted with terminators so that takes care of one end of the chain - all you need to ensure is that the last device you plug in has a terminator fitted and that no other devices in the chain are terminated.

Using sub-standard or loose cabling can reduce the effectiveness of termination so, if you experience problems in your SCSI system, check both the cables and the termination before suspecting faulty hardware or software.

SCSI-2 introduced the concept of *active* termination rather than the *passive* termination that SCSI-1 recommended. Active terminators are substantially more expensive than their passive counterparts but are more reliable, especially if you are using long cables or many devices.

SCSI ID Numbers

So that SCSI devices can communicate together without conflict, each device must have its own unique identification number (its SCSI ID). This is a number between 0 and 6, allowing up to 7 devices to be connected on your SCSI chain (the Surf Squirrel interface has an ID number of 7).



Setting the SCSI ID Number

SCSI peripherals will normally have an ID Selector on the outside of the case; this will be a display that indicates the current ID number and a push or rotary switch that allows you to change the number. Simply ensure that all the devices in your SCSI chain have different ID numbers. If you cannot see an ID selector, consult your user manual or talk to the dealer that supplied your peripheral. In the worst case, try the device as the only one in your chain and run the SCSIMounter program supplied with the Surf Squirrel interface to ascertain the ID number.

Background Information on Serial

The serial port on the Surf Squirrel interface is a faster and higher quality version of the port of the same name that is built into your Amiga. The irritating thing about the Amiga's built-in serial port is that even on the fastest Amigas it is difficult to run the port reliably at 38,400 bits per second (bps), let alone at the 115,200 bps or more supported by some modern modems.

Older Amigas fitted with the 68000 CPU could manage only 9,600 bps; the A1200, with its faster 68020 CPU, should be able to run its built-in serial port at 19,200 bps; Amigas with the even faster 68030 or 68040 CPU should handle 38,400 comfortably and might, on a good day when the wind is blowing in the right direction but only if there is an R in the month... might just manage 57,600 if the connection is good.

The Surf Squirrel serial port can very comfortably run at 115,200 bps on a standard A1200.

If you have fitted a faster CPU into your A1200 then you can ramp up the Surf Squirrel serial port speed to as high as 230,400, provided of course that your modem supports this speed. In practice, assuming a standard A1200, if you have a 14.4K modem you can safely set the Surf Squirrel serial port to run at 57,600 bps, and if you have a 28.8K modem you can set the serial port to run at 115,200 bps.

So with Surf Squirrel and a 28.8K modem attached to your A1200 you truly will be able to surf the Internet or World Wide Web as fast, maybe even faster, than even the pundits can.

What's bps?

Serial and modem communications is all about getting the digital information in your computer into a format which can be sent down a standard telephone line. This digital information is represented in your computer's memory by ones and zeroes. Each one and each zero is a bit, which is computer shorthand for "binary digit".

The bits travel through your serial port, along your serial cable to the modem, where they are then converted by the modem into a signal which can be sent along a telephone line. The speed at which the modem can move bits around is measured in bits per second or bps.

OK, but what's a serial port?

The serial port is designed primarily to connect a modem to your computer. Certainly there are other peripherals which communicate with computers via the serial port, but it is a modem which the vast majority of computers have connected to their serial ports.

It's called serial because the bits travel along the cable one at a time, one after the other, in single file as it were. In a serial cable there are only two wires along which data bits can travel - one wire for outgoing bits, another wire for incoming bits.

Speaking of cables...

You will notice that the Surf Squirrel serial port looks very different to the one on the back of your A1200. There are far fewer pins on the Surf Squirrel serial port. In fact there are nine. The A1200's port has 25, yet there is nothing the Amiga serial port can do that the Surf Squirrel port cannot.

The difference is merely in the connectors and they way Surf Squirrel is wired internally. The 9-way connector is the most prevalent industry standard - you will have no difficulty buying a cable to go between your modem, which will probably have a 25-way port, and Surf Squirrel because this is precisely the cable which millions of PC owners use.

Modems usually have 25-way serial ports because they need to support extra features on some machines, most notably on IBM mainframes. To support these features they need extra wires, hence 25-way connectors instead of 9-way.

The Amiga has a 25-way serial port for similar reasons. For example two of the pins of the Amiga's serial port carry voltages which could be used to power peripherals connected to it. There are also connections between the serial port and the Amiga's left and right sound outputs. Very few Amiga peripherals make use of these extra serial port features - indeed we can't think of one that has ever made use of the audio lines.

When you buy your modem your Amiga dealer may provide you with a free serial cable. If so, this will probably have 25-way plugs at both ends. You can either ask your dealer to swap it for a cable which has a 9-way connector at the "computer" end, or buy a small connector which converts from 25-way to 9-way. To connect to Surf Squirrel the 9-way connector on the cable or converter must be female - in other words it must have nine holes in it, not nine pins. The 25-way end of the cable will be male (pins) or female (holes) depending on the sex of the connector on your modem.

About modems...

There are so many types, makes and models of modem these days that it easy to get confused. Yet if you remember just one fact when shopping for a modem you won't go far wrong: The faster your modem can convert digital data into signals that can travel along telephone lines (known as analogue signals), the faster you will be able to read your email, download files and surf the Internet or World Wide Web, assuming of course that your Internet Service Provider also has fast modems.

The two most common types of modems available today are called V.34 and V.32bis modems. V.34 modems can communicate at speeds of 28,800 bps, or 28.8K for short. V.32bis modems, which are a little older and slower, operate at 14.4K bps, exactly half the speed of V.34. Although 28.8K modems are more expensive than 14.4K ones, keep in mind that the quicker you can get connected, download the information and then disconnect, the cheaper the phone call will be. You will certainly save the extra cost of a 28.8K modem in cheaper phone bills - the more you surf, the quicker you'll get back the extra cost and actually begin to save money had you bought a 14.4K modem. This is why there are so many 14.4K modems on the second-hand market.

Leaving financial considerations aside for a moment, the difference in operating speed between 28.8K and 14.4K is tangible in use. If you were using a 14.4K modem to surf the Web and a friend sitting next to you was using a 28.8K modem to do the same thing, while your friend would be browsing a home page, or half way though a download, or have followed several links to another home page, you would be still waiting for the initial home page to appear on your screen.

Which make should you buy? To the average user it doesn't make a great deal of difference. It's a bit like buying a cola - they are all dark brown, wet and fizzy, they all taste pretty much the same, yet some people still insist on buying the expensive brand names because they "taste better". Other people, some would say wiser people, buy a cheaper cola and find that after they've drunk a few they get used to it and like it just as much as the expensive brand.

Having said that, some of the more expensive modems do have real features that you might be willing to pay extra for. For example a few will go faster than 28.8K, but only when speaking to another modem of the same kind. Others have "flash rom", which means that if bugs in the modem are fixed, or if the manufacturer invents new features, you can fix the bugs and get the new features without having to get and fit a new chip to the modem. Yet others can talk to cellular telephone networks, something which cheaper modems cannot do.

Do you need these kinds of features? If not, don't waste your money on them. Of course, some people actually like large lumpy modems that have lots of flashing lights on them; the rest of us seem to prefer small, discreet modems that don't require much desk space.

Data compression

If you're new to serial communications and you've read from the beginning of this section on serial devices, then you might by now be a little confused about speeds. We started by telling you that the Surf Squirrel serial port can run at up to 230,400 bits per second (bps), and we ended by recommending that you by a 28.8K (28,800 bps) modem.

Huh? What's the point of the Surf Squirrel serial port running at up to 230,400 bps when the modem's speed is only 28,800 bps? Let us explain.

When you begin serial communications your Amiga speaks to your modem, your modem speaks to the modem at the other end of the phone line, and the modem at the other end of the phone line speaks to another computer. So we have three "conversations" going on here: computer-to-modem; modem-to-modem; modem-to-computer.

The modem-to-modem conversation is the one which is governed by the modem speed. The conversation can take place only as fast as the speed of the slowest of the two modems. So if you've got a 28.8K modem and there's a 14.4K modem at the other end of the phone line, then your 28.8K will switch into 14.4K mode so that it doesn't speak too quickly for the other modem to understand what it is saying. If you try to force your modem to speak to the 14.4K modem at 28.8K, then the end result will be silence because the 14.4K modem will withdraw itself from the conversation.

So the "modem speed" is the speed at which modems communicate with each other. It is not the speed at which your modem communicates with your Amiga. That is your "serial port speed", which, as we indicated earlier, can be set as high as 230,400 bps depending on your set-up.

The reason for the higher Amiga-to-modem speeds is because of something called data compression. Both 14.4K and 28.8K modems use a compression technique (called V.42bis) which can squeeze as much as four times the amount of data down the phone line as would be sent if no compression was used. Now then. While 4-to-1 is the theoretical maximum, in practice a compression rate of about 2-to-1 is more realistic because not all data can be compressed by the same amount. Text compresses well and is where you'll get the most benefit from data compression, but data which is already compressed, like pictures and archives, will not compress any further.

To make use of compression you need to send data to your modem fast enough for it to have time to compress the data before sending it down the phone line at 14,400 or 28,800 bps. Scale 14,400 up by a 4-to-1 compression ratio and you have 57,600 bps; and 28,800 by 4 is 115,200 bps. Recognise those numbers?

Note that this serial port setting should be configured in your Internet or other serial communications software, not in the Workbench Serial preferences editor. Most serial communications programs have their own serial preferences and don't use the system settings. In any case, the Workbench Serial preferences editor only goes as high as 19,200 bps. (Its 31,250 option is for MIDI interfaces.)

Your Notes

Setting up Surf Squirrel

This section describes how to connect and install your Surf Squirrel; this is an important chapter, please read it carefully.

Using your Surf Squirrel Interface

Setting up a SCSI device for use with your Surf Squirrel interface consists of several steps:

- Installing the Surf Squirrel interface hardware and software.
- Connecting the devices on your SCSI chain together.
- Preparing each device for use and installing suitable drivers on your Amiga's boot disk.
- Attaching a suitable modem.

Installing the Hardware

The Surf Squirrel interface is supplied as a PCMCIA device, ready for plugging into your A1200 computer.

Having carefully unpacked the interface and checked it, you are ready to plug the Surf Squirrel interface into the PCMCIA slot on your Amiga; this slot is located at the left side of the A1200.

Place the Surf Squirrel interface to the left of your A1200 so that the largest area of the interface is uppermost and the SCSI lead exits to the back of the interface. Now you should find that the 68-pin connector on the rightof the Surf Squirrel fits neatly inside the PCMCIA opening. *Gently* push the interface into this slot until you meet resistance and then, gently but firmly, push a little further so that the Surf Squirrel locates correctly on the pins of the PCMCIA interface. You may find that a very slight side-to-side movement will help location.

Please note that, although the Surf Squirrel box is a fully moulded PCMCIA shape, if you use excessive force you may damage your PCMCIA connector... the pins inside the Amiga are *extremely* delicate - only slight to moderate pressure is required to fully locate the card.

Attaching SCSI Peripherals

Attaching SCSI peripherals is simply a matter of daisy chaining them together. First ensure that all SCSI devices are turned off and that either the Surf Squirrel interface is unplugged from your Amiga, or the power to your computer is turned off.

With everything turned off, choose unique SCSI IDs for each device you are about to attach.

If you are attaching the first device, connect the 50 way cable from the Surf Squirrel interface to either socket on your SCSI device.

If you are attaching a second or subsequent device connect one of the daisy chaining sockets from another device in the chain to your new peripheral, using a 50-way cable.

When you have all devices connected, ensure that the last device on the chain is terminated and that no other device is terminated. Note that many suppliers ship peripherals which are internally terminated, if you are unsure if a peripheral is terminated internally or not, check with your supplier.

> If you have only one device which is internally terminated, rearranging the chain so that it is the last device will save you the trouble of removing any internal termination.

Installing the Surf Squirrel Software

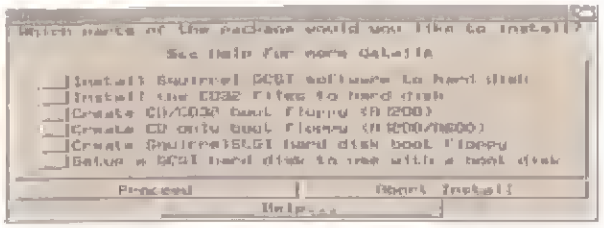
Please note that you must install the Surf Squirrel software for your SCSI and serial drivers to work fully, even if you have previously installed the Classic Squirrel SCSI interface.

Also, if you previously owned a Zappo/Archos CD-ROM or hard drive, please remove all traces of this installation (including from the startup file) before installing Surf Squirrel.

Exactly how you use the Surf Squirrel installation program will depend on what SCSI devices you have attached to the interface. The installation program uses a simple Install utility and you can choose your level of experience before proceeding and obtain assistance through the use of the Help button at any time.

Note that every installation option will install the Squirrel serial driver as well as any other files.

Now double-click on Install-Squirrel from your backup of the first Surf Squirrel Master Disk (you have made a backup, haven't you?) and, after the first two screens you will see the following requester, or one that looks very like it:



The first option is relevant if you intend to use any SCSI peripheral and you already have an internal hard disk on your A1200. This option copies the SCSI drivers, SCSIMounter (the hard disk mounting program) and the CD support (but not CD32 support) to your internal hard disk.

The second option is relevant if you want to play CD32 games on your A1200 and you already have an internal hard disk. This option copies the CD32 support to your internal hard disk and, if you have not selected the first option, any necessary SCSI drivers.

The third option is used to create a floppy disk with which you may boot your A1200 to start a CD32 title (whether you have an internal hard disk or not).

The fourth option is used to create a floppy disk with which you may boot your machine when you wish to access a CD (but not a CD32 title); this option may be used whether you have an internal hard disk or not.

The fifth option is used to create a floppy disk with which you may boot your machine if you do not have an internal hard disk but do have an external SCSI hard disk. This floppy will only be needed when you first switch on the computer, thereafter full booting will take place from the external SCSI hard disk, assuming that this has been prepared correctly as detailed below.

The sixth option is used to when you do not have an internal hard disk and wish to copy the contents of you Commodore supplied Workbench floppy disks to an external SCSI hard disk for use in conjunction with a hard disk boot floppy.

Note that, whenever the SCSI driver is installed, the squirrelserial.device will also be installed in your devs: drawer.

Installing SCSI support for an external Hard disk or CD Drive on the A1200 with an Internal Hard Disk

For this machine configuration choose only the first option on the install page ("Install Squirrel software to hard disk"). This option copies the SCSI drivers, CD drivers and SCSIMounter to your hard disk.

When using this option the necessary modifications to mount any hard disks during boot up (using SCSIMounter) are added to your User-Startup file.

If you are not installing the CD32 support at the same time (the "Install the CD32 files to hard disk") the CD0 icon (used for mounting CD drives) is placed in the Storage/DOSDrivers drawer on your boot partition. Prior to using the CD file system you will need to modify the UNIT= tool type (obtained by clicking on the file and selecting Information... from the Workbench Icons menu) in the CD0 icon to reflect the SCSI ID number of your CD-ROM drive.

Using this machine configuration the CD drive will not be started until the CD0 icon is double clicked; this may be done automatically by moving the icon to the Devs/DOSDrivers drawer.

Installing CD32 support for the A1200 with an Internal Hard Disk

For this machine configuration choose either the second option only or the first and second options. This option copies the SCSI drivers, CD driver and CD32 support to your hard disk.

When using this option the necessary modifications to auto-start a CD32 title during boot up are added to your Startup-Sequence file.

Using this option the CD file system (CD0) is controlled via the CD32 emulator rather than directly by the SCSI device and is placed in the Devs/DOSDrivers draweron your boot partition. The SCSI ID of the CD-ROM drive is then set using the CDDevice program (which is automatically started as part of the installation process).

Building a CD32 boot floppy disk for the A1200 with CD-ROM Drive

For this configuration choose the third option ("Create CD/CD32 boot floppy"). This option creates a bootable floppy disk used to start a CD32 title and may be used whether or not you have an internal hard disk.

This option formats a floppy disk and copies a number of files to it; the CD32 title may then be started by inserting a suitable CD into your CD drive and rebooting your machine with this boot disk in your floppy drive.

The SCSI ID of the CD-ROM drive is set using the CDDevice program (which is automatically started as part of the installation process).

Building a CD boot floppy for the A1200 with CD-ROM Drive and no internal Hard Disk

For this machine configuration choose the fourth option ("Create CD only boot floppy"). This option creates a bootable floppy disk which mounts CD0, used for accessing CD discs.

This option formats a floppy disk and copies a number of files to it; the CD drive may be accessed by rebooting your machine with this boot disk in your floppy drive and then inserting a suitable CD in the CD-ROM drive.

Prior to using the CD file system you will need to modify the UNIT= tool type in the CD0 icon to reflect the SCSI ID number of your CD-ROM drive. The CD0 file is found in the Devs/DOSDrivers drawer of the boot disk which this installation creates.

Preparing an external SCSI Hard Disk with no Internal Hard Disk

For this machine configuration a considerable amount of setup is required to successfully build a bootable external hard disk:

- Boot your machine with the backup of the Surf Squirrel SCSI master disk.
- Open the Tools drawer and run SquirrelHDToolBox; using this program, partition your hard drive as described in the ***Preparing a Hard Disk with HDToolBox*** section.

- Having partitioned the hard disk, open the SquirrelSCSI drawer and the SCSIMounter drawer inside it, then run SCSIMounter. Choose the hard disk you have just partitioned and select Mount to mount all of the partitions you have created.

- With the partitions mounted, open the System drawer and run the Format program; select one of the partitions which you have created and format it (a Quick Format is all that is required). You will need to perform this operation for every partition you have created. The partition which you intend to install the system software onto must be given the name "Workbench" when formatting.

- Run the installation program and select the "Create SquirrelSCSI hard disk boot floppy" and "Setup a SCSI hard disk for use with a boot disk" options. First this will create an autoboot floppy for use with your hard disk (i.e. a disk which will load the autobooting driver into memory so that the Amiga can control the external hard disk see the ***Autobooting*** section). The second option will then ask you to select the partition to copy the Workbench files to, select the partition you named "Workbench". The installation process will then ask you for each of your Commodore/Amiga Technologies supplied Workbench disks so that it may copy them to your hard disk.

If you now remove all the floppy disks from your Amiga and reset it using the Ctrl + Amiga + Amiga reset procedure, your Amiga should boot from the SCSI hard disk.

Should your Amiga not boot from the SCSI hard disk, do not worry. Insert the Surf Squirrel autoboot disk, created by the installation, into your Amiga's internal floppy drive. The Amiga will boot from the floppy disk and then ask you to remove the floppy disk from the Amiga. Upon doing so, your Amiga will reboot and then start booting from your external SCSI hard disk.

Autobooting

The Surf Squirrel allows you to autoboot from external SCSI hard disks connected to the Surf Squirrel's SCSI port. This can only be performed on devices such as hard drives or removables (Zip drives etc.). Before you can autoboot from your SCSI device, you must load the Surf Squirrel's SCSI driver into memory so that it is "reset proof". What this means is that the driver has to be loaded into an area of memory that is not erased when you perform the standard Amiga reset function from the keyboard (Ctrl key + left Amiga key + right Amiga key). When the Amiga is reset in this manner, the driver stays in memory and will automatically boot from the SCSI device with the highest boot priority (see ***Using Advanced Options with Partitioning*** in the HDToolBox section).

To load the autobooting driver into "reset proof" memory, you must have either the Surf Squirrel install disk or an autoboot disk (created by the Surf Squirrel installation) inserted in your Amiga's internal disk drive when you power-up your Amiga.

You should be aware of the fact that the driver will be removed from memory if you turn the power switch on the power supply off. It should also be noted that, because the driver remains resident in memory during resets, some anti-virus software may try to remove the driver from memory.

Working With Your New SCSI Peripheral

For many SCSI devices attached to your Amiga obtaining the desired results requires the co-operation of many pieces of software; this section includes suggestions on how to accomplish this for various devices.

First run the installation program from your Surf Squirrel install disk and select the appropriate options for the type of device you are installing. This will copy the necessary files and programs to your boot disk (either you internal hard disk, or a boot floppy) for the device types you select.

About DEVICEs, SCSI IDs and UNIT numbers

Most disk-like devices which you attach to the Amiga will require a mount file, these are described in detail in Appendix A, but for most uses either SCSIMounter can be used to prepare one (if using a standard Amiga disk format), or an existing one can be copied and modified.

The first piece of information a mount file requires is the name of the "SCSI Device"; for the SquirrelSCSI interface the device name is squirrelscsi.device, most mount files store this information in the tool types of a Workbench icon, hence one of the lines in the tool type should be:

```
DEVICE=squirrelscsi.device
```

Note that the name is entirely in lowercase and must be used in lowercase.

The second piece of information which will be required is the SCSI ID, or unit, of the device you are attempting to mount; again this is normally stored in the tool types, so if for example you had a Floptical® connected at SCSI ID 2, one of the tool type entries would read:

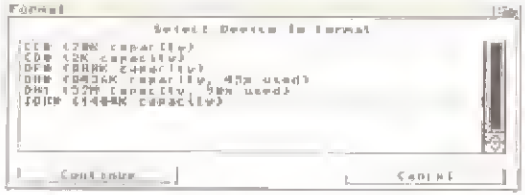
```
UNIT=2
```

For some device types, typically multi-disk auto changing CD-ROM drives, a Logical Unit Number (or LUN) is also required. This is encoded into the 10's digit of a UNIT number, so a line such as UNIT=12 would indicate LUN1 on SCSI ID 2. Note that in general LUNs are fixed internally by a SCSI device , with no way for the user to modify them.

Fixed Media Hard Drives

Fixed media drives, are the easiest devices to set up; after connecting your hard drive, start SquirrelHDToolBox from the Tools drawer of your Workbench disk and follow the instructions in the section ***Preparing a Hard Disk with HDToolBox***.

After partitioning the drive the new partitions may then be mounted using SCSIMounter and DOS formatted using Format (found in the System drawer of your boot disk):



Selecting a drive for high level formatting

Removable Media Drives

Removable media devices are among the most difficult to use successfully on any machine (or rather to use successfully when you need to change disks without rebooting).

For many SCSI adapters special programs (or even explicit DiskChange commands) are required to ensure that media insertion/eject is correctly recognised; for the Surf Squirrel adapter media change is handled fully by the driver software.

When preparing a removable cartridge for use you should follow the instructions for a fixed media hard disk, however use only *one* partition per cartridge and ensure that every cartridge has the same partition name; following these two simple rules will save you many hours of head scratching!

Multi-format removable hard drives

If you are working with a drive which supports several media types (for example a 105/270Mb SyQuest) then there are additional rules which you should follow for working successfully with all cartridge formats. As for simple removable devices each cartridge should have only one partition, however each different cartridge format should have a unique partition name, for example: you might name all 105Mb SyQuest cartridges SQ105, and all 270Mb cartridges SQ270.

When you have successfully partitioned and formatted a cartridge of every flavour you intend to use, use SCSIMounter to create a mount file for each cartridge flavour and place all these mount files in the Devs/DOSDrivers drawer. You should then find that as you insert and remove each cartridge the Amiga will successfully recognise the different cartridges.

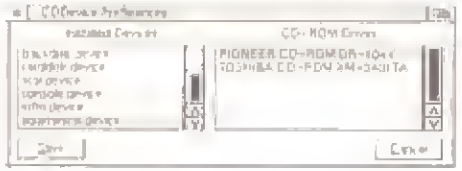
> Technically the Amiga's FastFileSystem cannot mount more than one partition per unit (and having two different cartridge flavours counts as two partitions). The SquirrelSCSI device driver uses some 'tricks' to allow multiple media formats (up to 16 per unit), but be careful if attempting to use the procedure described in this section with other host adapters; if they do not 'understand' at best you will not achieve the results you expect, at worst you may destroy all of the data on one of your cartridges.

CD-ROMs

Installing the drivers for a CD-ROM drive is much simpler than preparing a hard disk for use since there is no formatting or preparation of the media required!

Using the Surf Squirrel installation disk, run the Installation program and select CD-ROM support; this will copy all the necessary drivers and programs to you boot disk.

At the end of the process the CDDevice preferences editor is started by the installer, you should select the CD-ROM drive you wish to use from the right hand pane (the left hand pane should already show squirrelscsi.device selected).



Selecting a CD-ROM drive

Rebooting your machine should then automatically mount the CD-ROM drive ready for a CD to be inserted.

Advanced CD mounting

If you have several CD drives connected (or are using a multiple disk auto-changer) then you should choose one as CD0 (which will always be used for CD^{32} access) with a DEVICE field of cd.device and a UNIT of 0 (as shown in the Workbench's Info requester). For the *other* devices you can then make copies of the CD0 file, changing the name to CD1, CD2 etc. and with a DEVICE field of squirrelscsi.device and a UNIT set to the correct SCSI ID for the device.

Tape Drives, Scanners and Printers

Whilst the Surf Squirrel interface does not include any software for using these devices directly, using them with third party drivers is no harder than selecting the correct DEVICE (squirrelscsi.device), the correct UNIT (the SCSI ID of the device) and then following the instructions which came with your third party device driver.

Attaching a Modem

There is no special advice that we can offer when fitting a modem although you will probably benefit from reading the Introduction chapter before purchasing a modem for use with Surf Squirrel.

We recommend a 28,800bps V34 modem if you can afford one (and they are certainly coming down in price) to extract the maximum benefit from the fast serial port on the Surf Squirrel.

Fitting your modem is simple - using a 9-way D-type socket (female) to 25-way D-type plug (male) plug your Surf Squirrel and modem together. This lead will normally be supplied with your modem - if not you should contact your local computer shop or HiSoft directly. Also do this if your modem does not have a 25-way D-type socket on it.

In order for all serial commands from an application (e.g. comms program) to be routed through the Surf Squirrel's fast serial port it is only necessary to set the application's serial driver to squirrelserial.device - this device will have been placed in your devs: drawer by the Surf Squirrel installation program.

Your Notes

Preparing a Hard Disk with HDToolBox

HDToolbox provides a variety of tools for controlling these hard drive operations:

- Preparing a new hard drive
- Starting HDToolbox
- Changing the drive type
- Partitioning a hard drive
- Mapping bad blocks
- Low-level formatting a hard drive
- Modifying file system options
- File system maintenance

> Because many functions of HDToolbox involve erasing all the information stored on your hard drive, the entire contents of your hard drive should be backed up before using the program.

Preparing a New Hard Drive

Preparing a hard drive for use can include some or all of these steps:

1. Reading and saving the hard drive type.
2. Locating bad blocks.
3. Partitioning the hard drive.
4. Selecting a file system and file system options.
5. Specifying the boot status of the partitions.
6. Formatting new partitions.

Consult your drive's installation manual for more information on installing and using a new storage device.

Starting HDToolbox

To run HDToolbox from your hard drive:

1. Open the Workbench partition.
2. Open the Tools drawer.
3. Double-click on the SquirrelHDToolbox icon.

Your Tools drawer will have two apparently identical programs: HDToolBox and SquirrelHDToolBox. HDToolBox is the standard Commodore program for managing an internal hard drive; SquirrelHDToolBox is a small program which starts HDToolBox, but instead instructs it to work via the Surf Squirrel Interface.

The first window displayed is the Hard Drive Preparation, Partitioning and Formatting window, illustrated in Figure 1.

Figure 1. Hard Drive Preparation, Partitioning and Formatting Window

This window provides a list of the hard drives connected to your system and displays information about them. Use it to select the drive and the function you want to perform. If there are more drives connected to the system than can be displayed at once, scroll the contents of the list by using the scroll bar or the scroll arrows at the right side of the list.

The following information is displayed for each physical drive:

Interface	Identifies the hard drive type as SCSI or XT. (Other drive types, such as AT IDE drives, show up as SCSI in A1200 and A4000 series systems.)
Address	Displays a value, 0 through 6, that you have set for each SCSI device attached to your system. Each SCSI device on your system must have a different address. The SCSI host adapter is address 7 by default. See the hard drive documentation for more information, including the address jumper location of the drive. If you add additional drives, be sure to set them to different (unused) addresses. If two or more devices are jumpered to the same address, the system does not function properly.
LUN	Shows the Logical Unit Number (LUN) of a drive, a value from 0 to 7. The LUN is a secondary address, used only by those SCSI devices that have more than one storage unit, such as a multiple-disk CD-ROM drive. The LUN of a SCSI hard drive is usually 0. See the hard drive documentation for more information on whether it supports multiple LUNs and/or how to change them.
Status	Shows whether you have made any changes to a drive in HDToolbox that have not been saved. To save changes after any HDToolbox operation, you must click on the Save Changes to Drive gadget on this window. This gadget is ghosted when there have been no changes.
Drive Type	Shows the manufacturer, name, and revision level of the drive. This is the information reported by the drive to HDToolbox and may not correspond exactly to that listed in the hard drive documentation. If the drive is listed as Unknown, the reason might be either of the following: • The configuration (Drive Type) of the drive has not been established yet. • The selected device is a SCSI device other than a disk drive, such as a tape drive or scanner.

For All Actions in HDToolbox

For all the tasks that follow:

1. Highlight the drive you want to affect, then click on the gadget for the task.

2. When you are entering information, you must click on the appropriate text gadget, delete the existing information, type the correct information, and press Return. Always press Return after entering new information.

> Clicking on the Cancel gadget (present on each window) returns you to the previous window without saving any changes.
>
> Clicking on the Ok gadget accepts the changes on this window and returns you to the previous window.

3. When you have completed the task and returned to the opening window, click on the Save Changes to Drive gadget and click on Continue on the requester to confirm the save.

4. When you have completed all changes to your hard drives, click on Exit. For some changes to your hard drive, a requester appears prompting you to reboot the system; click on Continue to reboot.

Changing the Drive Type

For your system to function properly with a hard drive, it must recognise the type of hard drive it is using. The configuration of the hard drive that came with your computer is already set and does not need to be changed.

Use Change Drive Type to:

- Enter the specifications for a new hard drive.
- Change the drive type when you replace a hard drive.
- Edit the specifications of an existing hard drive.
- Delete an existing hard drive from the list.

When you add a new hard drive, you supply your system with the specifications of the hard drive through HDToolbox. These specifications include the manufacturer name, the model number, and the storage size.

HDToolbox can read the specifications directly from a hard drive using the Read Configuration option in the Define/Edit Drive Type window. Although you can enter these specifications manually from the documentation that came with the hard drive, we recommend using Read Configuration to reduce errors caused by typing mistakes or outdated documentation.

> When you enter or change drive type information, you only update a database of drive specifications, which is used for other HDToolbox operations. You do not change the physical specifications of the hard drive.

To change or add a new drive type:

1. Click on the Change Drive Type gadget in the Hard Drive Preparation, Partitioning and Formatting window to access the Set Drive Type window, illustrated in Figure 2.

Figure 2. Set Drive Type Window

This window lists any drives whose specifications you may have already defined and stored on the disk. The system displays a new drive as Unknown.

2. If necessary, click on the cycle gadget so it displays SCSI or XT, depending on the type of hard drive you installed. Select SCSI for an AT IDE drive.

3. If you are adding a new drive type, click on the Define New... gadget

   or,

   if you are editing an existing drive type, click on the Edit Old... gadget.

   Either of these selections takes you to the Define/Edit Drive Type window, illustrated in Figure 3.

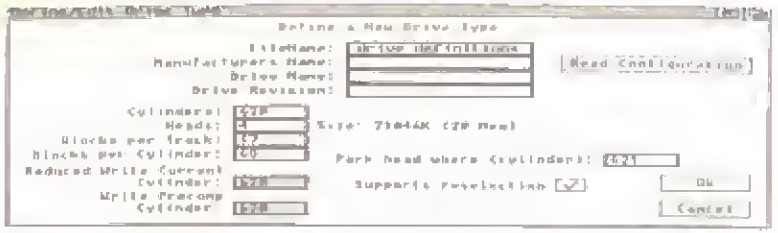


Figure 3. Define/Edit Drive Type (Drive Type Unknown)

When creating a new drive type with the same name as an existing drive type, HDToolbox uses the version with the most recent date. To save the correct change, make sure that your system clock shows the current date and time before saving.

4. Click on the Read Configuration gadget to automatically read the drive specifications, then proceed to Step 5.

To record the specifications manually, use the specifications supplied by your hard drive manufacturer for entering the required information explained below.

The specifications on the Define/Edit Drive Type window are:

FileName	A file named "drive definitions" in the drawer containing HDToolbox contains all of the drive specifications you have saved. Since you can save multiple drive types and their specifications in this file, you do not need to change this file name.
Manufacturer's name	Displays the name of the drive manufacturer, using up to eight characters.
Drive Name	Displays the name of the drive, using up to sixteen characters.
Drive Revision	Displays the number of the drive revision, using up to four characters.
Cylinders	Displays the number of drive cylinders.
Heads	Displays the number of drive heads.
Blocks per Track	Displays the number of blocks on each track. Some manufacturers list this as sectors.
Blocks per Cylinder	Displays the number of blocks in each cylinder. This is normally the number of heads multiplied by the number of blocks per track.

Size	Displays the amount of memory space on the drive in kilobytes (K) or megabytes (MB) After you have entered information into the Cylinders:, Heads:, and Blocks per Track: text gadgets and pressed Return, the value listed after Size changes. When you are finished, compare the listed size to the drive specification, to ensure that it is close to the value given by the drive manufacturer. The size need not exactly match the manufacturer's
Reduced Write Current Cylinder	Not used with SCSI, IDE, or XT devices.
Write Precomp Cylinder	Not used with SCSI, IDE, or XT devices.
Supports reselection	Indicates whether a SCSI device supports reselection. Unless you know that your device does not support reselection, this gadget should be selected (check mark appears) Changing this gadget has no effect on a partitioned device.
Park head where (cylinder)	Displays the number of the cylinder recommended by the manufacturer for parking the read/write heads of the drive. Parking the heads moves them to an unused area on the drive to protect data from potential hardware failure (a rare occurrence). Primarily used by XT hard drives. Drives that automatically park the drive head (almost all modern SCSI and AT IDE drives) ignore this parameter. Refer to the manufacturer's documentation. If no value is given by the manufacturer, use the number of the last cylinder.

5. Click on the Ok gadget on the Define/Edit Drive Type window to save the currently displayed specifications to the drive definitions file and return to the Set Drive Type window.

When you save changes to an existing drive type, a requester is displayed reminding you that previous specifications for the drive will be overwritten. To confirm the save, click on Continue.

Saving an edited Drive Type wipes out all existing partition information and any stored data on the drive. This is true even if the drive type specifications you save are no different from the drive's previously saved specifications.

6. Click on the Ok gadget in the Set Drive Type window to return to the Hard Drive Preparation, Partitioning and Formatting window. To confirm the save, click on Continue on the requester that appears, warning you that saving destroys any existing partition information on the drive.

> When you run HDToolbox from the Install disk and you create or edit a drive type, a requester appears warning you that the disk is write-protected; change the FileName field to RAM:drive definition to avoid this.

Partitioning a Hard Drive

Because the storage capacity of hard drives is large, your hard drive can be divided into partitions that are subdivisions of the hard drive's storage space. Each partition on your system appears as an icon on the Workbench screen.

Reasons for partitioning include:

- Organising your work. You may want to keep certain files (such as your own application programs and files) in their own partition so you can find them more easily.
- Keeping AmigaDOS separate from a new operating system you have added (such as MS-DOS or UNIX).
- Dividing your work space reduces the potential scope of damage if hard disk problems develop.
- Reducing fragmentation of partitions for a more efficient system.

> The best time to partition the hard drive is before you begin using it, since partitioning erases all information stored on the altered partitions.
>
> Before you repartition a partitioned hard drive, back up the entire hard drive. You can restore data from the backup when you are finished partitioning.

This section describes the following tasks you can perform on a hard drive:

- Using the partitioning window (including deleting a partition and using the default partition setup).
- Adjusting the size of a partition.

- Adding a new partition.
- Renaming a partition.
- Saving and formatting your new partitions.
- Using advanced options with partitioning.

Using the Partitioning Window

Click on the Partition Drive gadget in the Hard Drive Preparation, Partitioning and Formatting window to see the Partitioning window, illustrated in Figure 4.

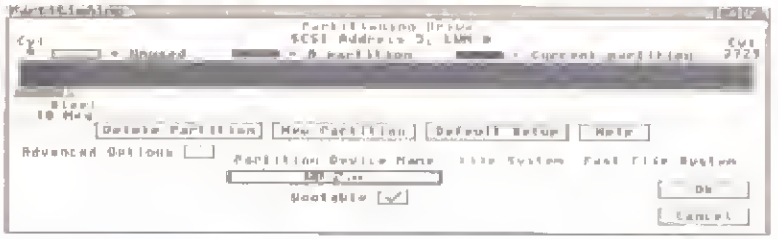


Figure 4. Partitioning Window (without Advanced Options)

> If the drive type displays as Unknown on the main window, the Partition Drive gadget is ghosted. You must first set up the drive type as described in "Changing the Drive Type".

On the Partitioning window:

Partitioning bar	Displays the space allocated to each partition, as well as unused space. Select a partition by clicking on one of the areas in the bar. The selected (current) partition is displayed in the colour indicated in the legend above the partitioning bar. You can also move left and right through the partitions by using the arrow keys.
Delete Partition	Click on this gadget to delete the current partition.
New Partition	Click on this gadget to add a new partition in an area of unused space. See "Adding a New Partition" for complete steps.

Default Setup	Click on this gadget to define two partitions of equal size. For Default Setup, the partitioning bar shows one partition named xDH0: and a second partition named xDH1:, where x is the first letter of the name of the drive manufacturer. You can rename the partitions using the method described in "Renaming a Partition"
Help	Click on this gadget to view online information about this window.
Advanced Options	Indicates whether advanced options display on the window. Click on the gadget to toggle between displaying and hiding the advanced options. See "Using Advanced Options with Partitioning".
Partition Device Name	Displays the name of the selected partition.
File System	Displays the file system of the selected partition.
Bootable	Indicates whether the selected partition can be used to boot the system. The default is bootable for the first partition and not bootable for all other partitions. Click on this gadget to toggle between bootable and not bootable. You must install your Amiga operating system files on the partition before you can actually boot from it.

Partitioning is based on your personal choice of how you want to configure your system. Review the following options thoroughly before making any adjustments to the default partitioning scheme.

Adjusting the Size of a Partition

You can increase or decrease the size of a partition using the triangle displayed under the partitioning bar. Note that you cannot expand the size of a partition over a partition that already exists.

Click on the triangle and drag it to the new position and release the button. The new size of the current partition is displayed under the triangle.

You can slide partitions to make room for a new partition or to consolidate portions of unused space. Partitions only slide on unused space in the partitioning bar; they cannot slide over existing partitions. Click on the partition you wish to move and drag it to where you want it, then release the mouse button.

Adding a New Partition

You cannot create a new partition over a partition that already exists. If all of the space on your hard drive is in use (i.e., no unused space in the partitioning bar), first make space for the new partition by making existing partitions smaller (see "Adjusting the Size of a Partition"). Unused space appears as the colour indicated in the legend above the partitioning bar.

1. Slide existing partitions so you have a solid block of unused space within the bar for your new partition.
2. Click on the New Partition gadget.
3. Click on the unused portion of the partitioning bar where you want your partition.

   A new partition fills the previously unused space. The Partition Device Name text gadget displays CHANGE_ME. Follow the steps in "Renaming a Partition" below to change the partition name.

Renaming a Partition

1. In the partitioning bar, click on the partition you wish to rename.
2. Click on the Partition Device Name text gadget that displays the name of the current partition.
3. Delete the existing device name, type the new name and press Return. (Avoid using spaces in a device name.)

> This does not set the volume name of the partition, which can be done from Workbench.

Formatting Your New Partitions

When you are satisfied with your new partitions, you need to format them.

1. Click on the Save Changes to Drive gadget on the Hard Drive Preparation, Partitioning and Formatting window.
2. If necessary, a requester appears warning you that the system must be rebooted before changes take effect. Click on the Continue gadget to reboot the Amiga.

An icon should appear on the Workbench screen for each Amiga partition on the hard drive. (Non-Amiga file system partitions need to be mounted before they are available from Workbench or AmigaDOS.) You must now format each partition to make it ready for use.

3. Click on the icon of the partition to be formatted and select the Format Disk item from the Icons menu in Workbench. In the Format window, give the partition a new volume name (the name that appears under the partition's disk icon) and select the desired options. We recommend selecting the International Mode and Fast File System options.

4. Format the partition by clicking on the Quick Format (not Format) gadget. (A full format is not necessary with modern SCSI and AT IDE drives.)

Repeat steps 3 and 4 for each new partition.

Using Advanced Options with Partitioning

Clicking on the Advanced Options gadget on the Partitioning window displays additional gadgets, illustrated in Figure 5.

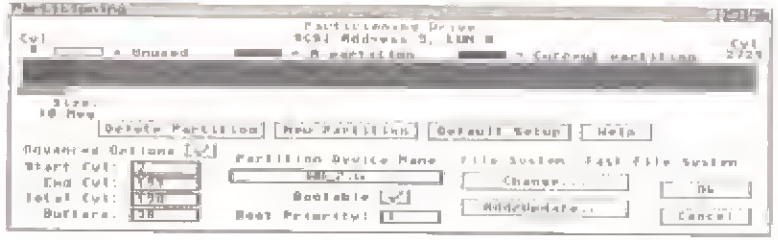


Figure 5. Partitioning Window (with Advanced Options)

These options provide more precise control over the parameters of your hard drive partitions. Be sure you fully understand the options before altering them.

Selecting Advanced Options adds these gadgets to the Partitioning window:

Start Cyl	The number of the first cylinder of the selected partition. This number can be any cylinder in the current partition, except for the last cylinder or any cylinder in the unused area before the partition. The Total Cyl number is adjusted accordingly.
End Cyl	The number of the last cylinder of the selected partition. This number can be any cylinder in the partition, except for the first cylinder or any cylinder in the unused area after the partition. The Total Cyl number is adjusted accordingly.
Total Cyl	The total number of cylinders of the selected partition. The End Cyl number is adjusted accordingly.
Buffers	The number of sector cache buffers used in the selected partition. Buffers improve disk access time, but use 512 bytes of memory per buffer. If you have enough free memory, you can use as many buffers as you wish. In general, use 30 to 50 buffers per partition.
Boot Priority	Determines which drive or partition boots your system. This applies only to partitions for which the Bootable gadget is checked. If you use a hard drive partition to boot, copy your Amiga operating system files into that partition. Although valid values range from 127 to -128, never set a partition's boot priority above 5 because this is the priority of the Amiga's floppy disk drive DF0:. We suggest that you set your boot partition's priority to 1 and any other bootable partition to a priority of 0.
Change	Takes you to the File System Characteristics window, where you can change the file system on the selected partition.
Add/Update	Takes you to the File System Maintenance window, where you can add, delete, and modify file systems.

Mapping Bad Blocks

A bad block is a portion of the hard drive that can no longer be read. Just as floppy disks can develop errors and corruption from being used repeatedly, hard drives can also develop errors. Hard drive errors, however, occur much less frequently.

Read/write error requesters can be the result of bad blocks. Other symptoms of bad blocks include frequent hardware and software failures and requesters. If you have added a new hard drive and formatted it, you should use HDToolbox to locate bad blocks before you begin to enter data.

Locating Bad Blocks

Most modern SCSI and IDE drives automatically locate and map out (avoid) bad blocks. With HDToolbox you can easily check then entire hard drive for errors. The program searches the hard drive and reports a list of blocks that have developed errors. These locations are then recorded on a separate window, known as the Bad Blocks window.

The Amiga uses the recorded blocks on the Bad Blocks list during initialisation to avoid using these areas. If HDToolbox finds errors in areas that contain data, it rewrites the data to a different area on the hard drive, if possible.

It is not unusual for a new hard drive to contain a few bad blocks before it is even used. Often, the manufacturer provides a list of bad blocks for your hard drive. You must enter these locations in the Bad Blocks list. On drives that handle bad-block mapping automatically, the process is invisible and you do not need to do anything.

Just as regular backups are necessary for proper hard drive maintenance, occasional data verification is also necessary. We recommend that you check the integrity of your hard drive regularly, depending on how often you use your hard drive.

Using Verify Data on Drive

To check a hard drive for bad blocks:

1. Click on the Verify Data on Drive gadget on the Hard Disk Preparation, Partitioning and Formatting window.

2. Click on Continue in the subsequent requester to begin the process.

   The duration for verifying the data on a typical 40 MB hard drive depends on the type of hard drive you are using.

3. Click on Continue on the requester that appears when verification is complete.

If HDToolbox finds errors, a requester is displayed listing the bad blocks with their locations on the hard drive.

Marking Bad Blocks

When either a recoverable or nonrecoverable error is found, the system will display the location of the block, illustrated in Figure 6.

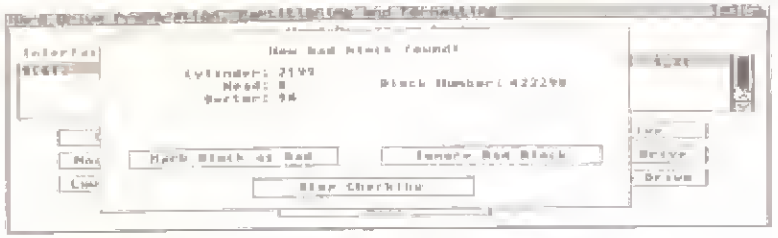


Figure 6. Bad block location and options

You must then choose one of three options:

1. Have the system add the block to the Bad Block List and then continue.

2. Ignore the block and continue verifying the data on the disk.

3. Stop the verification.

We recommend adding the block to the Bad Block List. After the verify is finished, click on Save Changes to Drive, click on Exit, and reboot the system.

Recoverable Errors

When the verify function in HDToolbox locates a potentially problematic block, it copies the information from that block onto a new block. This process prevents you from losing information if the block becomes unreadable. It is also reported as a recoverable error. You are not required to take any additional corrective action.

Nonrecoverable Errors

When the verify function in HDToolbox locates a block that cannot be read, the system reports it as bad block found. This is a nonrecoverable error and the information stored on that block is lost.

If the system reports a nonrecoverable error, use the Workbench Format Disk function or the Shell FORMAT command to format the partition. Then restore your files from your backup disks.

Adding a Bad Block to the Bad Blocks List

If the hard drive manufacturer has provided you with a list of bad blocks, you should enter them into HDToolbox on the Bad Blocks window. Many hard drive manufacturers use tests that locate blocks that are not currently bad, but might degrade over time. It is advisable to enter these blocks into the list even if HDToolbox does not identify them as bad.

Most SCSI and IDE hard drives handle bad blocks internally—they locate bad blocks themselves and avoid using these areas without any user intervention. Such areas are invisible to the system. The Verify Data on Drive function locates bad blocks that the hard drive itself did not find. At the bottom of the window, an informational message displays the number of bad blocks the hard drive located internally.

The Bad Blocks window displays a list of any blocks on the hard drive that might develop read/write errors. The computer uses this list to avoid using these areas.

To add a bad block to the list:

1. Click on the Modify Bad Block List gadget on the Hard Disk Preparation, Partitioning and Formatting window to view the Bad Blocks window, illustrated in Figure 7.

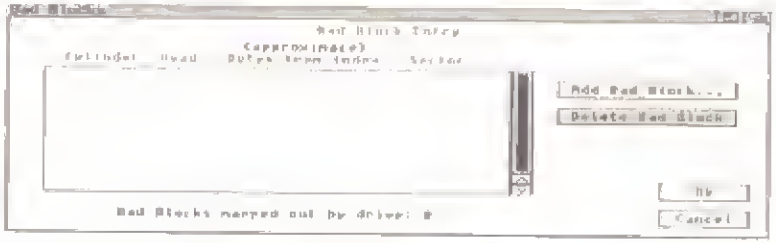


Figure 7. Bad Blocks Window

   If you have not previously located any bad areas on your hard drive, the scroll gadget in the centre of the window is empty. If bad blocks were found during verification, they are listed here. Bad blocks mapped out by the drive itself are not listed

   The list shows the location of the bad blocks by cylinder, head, bytes from index and sector. Note that the system lists a range for the approximate number of Bytes from Index, and you can only list one error per sector. Once a sector has an error, the entire sector is marked as bad.

2. Click on the Add Bad Block... gadget.

3. In the requester, enter the Cylinder, Head, Bytes from Index or Sector of the block.

4. Click on Ok to add this block to the list.

5. Click on Ok on the Bad Blocks window to save your changes and return to the Hard Disk Preparation, Partitioning and Formatting window.

To delete a bad block from the list:

1. Click on the Modify Bad Block List gadget on the Hard Disk Preparation, Partitioning and Formatting window to view the Bad Blocks window.

2. Click on the block to be deleted.

3. Click on the Delete Bad Block gadget.

4. Click on Ok on the Bad Blocks window to save your changes and return to the Hard Disk Preparation, Partitioning and Formatting window.

Low-Level Formatting

If you have added a new drive, you may need to low-level format it to prepare it for operation. A low-level format is commonly done by the drive manufacturer and ordinarily need not be done by you. In fact, IDE drives and most SCSI drives do not respond to a low-level format command. (This is not the same as the Workbench Format item on the Icons menu, which must be performed on each partition.)

If the drive does not respond to a Format attempt or does not save changes properly, you can attempt a low-level format.

To low level format a hard drive:

1. Click on the Low-level Format Drive gadget on the Hard Disk Preparation, Partitioning and Formatting window.

Caution: At this point, a warning requester is displayed telling you that all information on that drive will be erased.

2. Click on the Low-Level Format Disk gadget in the requester that appears.

   The duration of the format depends on the type of hard drive you are using. You are returned to the main window when low-level formatting is complete.

3. Click on Verify Data on Drive to identify any bad blocks on the disk.

Modifying File System Options

These functions are intended for advanced users.

A file system is software that organises data read from or written to a storage device. Amiga systems can use a variety of file systems. Amiga hard drives normally use one of several variations of the Fast File System (FFS).

You can switch to a different file system—perhaps to an upgrade in AmigaDOS or to a file system that is compatible with another computer system. HDToolbox allows you to modify the list of available file systems by adding new file systems, deleting file systems, and modifying existing file systems.

Caution: Changing the file system of a partition that contains data might make the data inaccessible.

Advanced users can use the File System Characteristics window to modify a partition's file system. Most users can safely ignore this window.

1. Click on the Partition Drive gadget on the Hard Disk Preparation, Partitioning and Formatting window to display the Partitioning window.

2. Click on the Advanced Options gadget to view additional options.

3. Click on the partition of the file system you wish to modify.

4. Click on the Change... gadget to display the File System Characteristics window, illustrated in Figure 8.

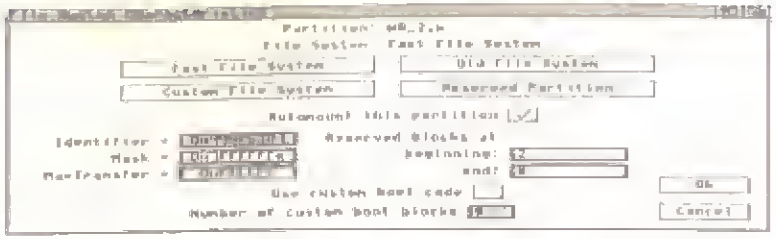


Figure 8. File System Characteristics Window

5. Choose the file system for the selected partition by clicking on one of the file system gadgets:

Fast File System	This is the default Amiga file system.
Old File System	This is the original Amiga file system. It may be necessary to choose this file system to read old Amiga hard disks
Custom File System	This allows you to select your own file system. You must first add the file system to the list as described in "File System Maintenance".
Reserved Partition	This will allow you to reserve an area on the disk without a partition. This area can be set aside for some special use, such as a UNIX operating system.

Set the following values for the file system. Note that hexadecimal numbers must begin with 0x.

Identifier	Displays, in hexadecimal form, the four-digit string for the ASCII codes that tells AmigaDOS what file system is being used. Amiga file system identifiers are as follows:

File System	Identifier	ASCII
Old File System	0x444F5300	DOS\00
Fast File System	0x444F5301	DOS\01
Int'l Mode OFS	0x444F5302	DOS\02
Int'l Mode FFS	0x444F5303	DOS\03
Dir Cache OFS	0x444F5304	DOS\04
Dir Cache FFS	0x444F5305	DOS\05

(Identifier is the same as the DosType parameter in Amiga mount files and in the File System Maintenance window.) The identifier can be modified only when Custom File System is selected.

Automount this partition	Select to automatically mount this partition when booting the system.
Mask	Displays the hexadecimal number that defines the areas of memory that can be used with Direct Memory Access (DMA). Mask is not available when using the Old File System (DOS\00).
	For example:
	A2091 and A590 0xFFFFFF
	A3000 series 0x7FFFFFFC
	A4091 and A4000T 0x7FFFFFFF
	Surf Squirrel 0x7FFFFFFF
	If you have another third-party controller, refer to the controller's documentation
MaxTransfer	Displays the hexadecimal number that determines the maximum number of bytes that can be moved during each DMA transfer. MaxTransfer is not available when using the Old File System (DOS\00).
	For example:
	A2091 and A590 0x1FFFFF
	A3000 series 0x1FFFFF
	A4091 and A4000T 0xFFFFFF
	Surf Squirrel 0xFFFFFF
	If you have another third-party controller, refer to the controller's documentation
Reserved blocks at beginning	Displays the number of blocks reserved at the beginning of the selected partition for file system specific usage. This value defaults to 2 and normally should not be set to less than 2.
Reserved blocks at end	Displays the number of blocks reserved at the end of the selected partition for file system specific usage. This value defaults to 0.

7. To retain your changes, click on the Ok gadget in each window until you return to the Hard Drive Preparation, Partitioning, and Formatting window.

File System Maintenance

The File System Maintenance window allows you to modify the list of available file systems. The file system software can reside either in ROM or as a file on disk. Currently, the standard Amiga file systems are in the Amiga's Kickstart ROM. Other file systems that the Amiga uses, such as the CrossDOSFileSystem and the CDFileSystem, are disk-based and are usually stored in the L: directory. Earlier versions of the Fast File System were also stored in the L: directory.

The following sections tell you how to add, delete, or change a file system, starting with the File System Maintenance window.

To get to the File System Maintenance window:

1. Click on the Partitioning gadget on the Hard Disk Preparation, Partitioning and Formatting window to view the Partitioning window.

2. Click on the Advanced Options gadget to show advanced options.

3. Click on the partition of the file system you wish to modify.

4. Click on the Add/Update... gadget to view the File System Maintenance window, illustrated in Figure 9.

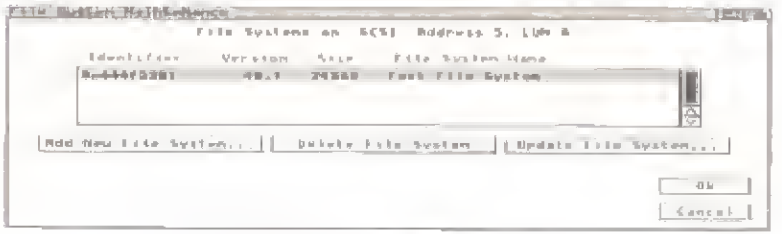


Figure 9. File System Maintenance Window

At the top of the window, the selected drive is displayed by address and LUN. Below, in the scrolling list, each file system stored in the reserved cylinders on that drive is displayed, showing its Identifier number, Version number, Size in bytes, and File System Name.

Adding a New File System

From the File System Maintenance window:

1. Click on the Add New File System... gadget
2. In the requester that appears, delete the existing text and enter the full path to the location of the new file system. Click on the Ok gadget.
3. In the subsequent requester, delete the existing DosType (Identifier) and enter the hexadecimal DosType of the new file system.
4. Click on the Version and Revision text gadgets and enter the numbers for the new file system. You can obtain this information with the AmigaDOS VERSION command.
5. Click on the Ok gadget to return to the File System Maintenance window. The new file system is copied to the reserved cylinders of the drive and its information appears in the list. (If a file cannot be found at the location you specified, the file is not a file system, a file system of that DosType already exists in the list, or there is insufficient room in the reserved cylinders, the operation fails with an explanatory requester.)
6. To retain your changes, click on the Ok gadget in each window until you return to the Hard Drive Preparation, Partitioning and Formatting window.

Deleting a File System

From the File System Maintenance window:

1. Click on the file system to be deleted and click on the Delete File System gadget.
2. To retain your changes, click on the Ok gadget in each window until you return to the Hard Drive Preparation, Partitioning and Formatting window.

Updating an Existing File System

From the File System Maintenance window:

1. Click on the file system to be changed and click on the Update File System... gadget.
2. In the requester that appears, delete the existing text and enter the full path to the location of the new file system. Click on the Ok gadget.
3. Click on the Version and Revision text gadgets and enter the numbers for the new file system. You can obtain this information with the AmigaDOS VERSION command.
4. Click on the Ok gadget to return to the File System Maintenance window. The changes are copied to the drive and the information appears in the list.
5. To retain your changes, click on the Ok gadget in each window until you return to the Hard Drive Preparation, Partitioning and Formatting window.

Your Notes

Using the CD32 Emulator

The Squirrel CD32 emulator is designed to operate transparently without any user intervention (setting special options etc.). The main configuration program, CDDevice, is stored in the Prefs drawer inside the folder where you installed the software (Work:CD32 by default).

The CDDevice preferences editor is used to configure which CD drive the CD32 emulator, cd.device, should use:

Selecting the CD-ROM drive

The left hand pane lists all the Amiga device drivers installed in your system, note that unless you have more than one SCSI card installed you should always select squirrelscsi.device.

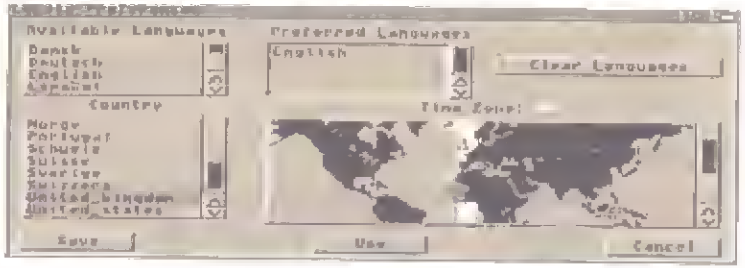
> Listed as one of the Amiga's devices on an A1200 is "scsi.device" - don't choose this one as it is really the device which is used for controlling your internal IDE hard disk!

Having selected a suitable device from the left hand pane, the right hand pane lists the CD-ROM drives which are found connected; select the device you wish to use and click Save. At this point you may see a message that a reboot is required for the change to take effect, this situation occurs when you have already mounted the CD drive (with or without a CD inserted).

When you have finished setting up via CDDevice, rebooting your Amiga with a CD32 title in the CD drive will start it running, booting with a no disk, or a non-CD32 title will boot your Amiga as normal (exactly like starting a game from floppy for example).

Setting the language

For CD^{32} titles which support multiple languages, the preferred language may be set via the standard system Locale preference editor (found in the standard Workbench Prefs drawer):



The Available Languages box lists the languages currently installed in your system, as you click on each item it moves to the bottom of the Preferred Languages list. For CD^{32} titles only the first item in the Preferred Languages list is used, so if your first choice langauge is not first in the list click Clear Languages and start the process of language selection again. Choose Save to save the changes you have made.

> The Local preferences editor is one of the standard system software components and is fully documented in the Workbench manual which should have been supplied with your Amiga.

The Title... Drawers

The Title... drawers (TitleMount, TitleSetup and TitleStart) are used to keep normal AmigaDOS scripts which are used to perform additional configuration of a CD^{32} title on a per-title basis.

The files in these drawers are named according to the name of the CD which requires them; if the CD32-Startup script finds one which matches the title it is starting up then the script is executed. This makes it very easy to add your own scripts if you find the need.

The TitleMount Drawer

The TitleMount drawer is used to keep scripts which are used immediately after the CD has been mounted. Typically these scripts are used to check whether a CD will successfully execute on your machine configuration.

The TitleSetup Drawer

The TitleSetup drawer is used to keep scripts which are used to "degrade" your Amiga to allow particular CD^{32} titles to run; whilst we could have always disabled all extra features might have over and above a CD^{32} (Fast memory, accelerator card etc.), many CD^{32} games work extremely well with such add ons and may even have extra features or speed.

The TitleStartup Drawer

The TitleStartup drawer is used to keep scripts which provide an alternate Startup-Sequence to be specified on a per-title basis.

Normally the CD32-Startup script after performing all of the necessary setup transfers control to the CD^{32} title by running the Startup-Sequence found on the CD. If instead a script matching the name of the CD is found in the TitleStartup drawer then rather than using the CD's Startup-Sequence this alternative script is used, allowing any incompatible parts of the startup to be easily modified.

The Presets Drawer

The Presets drawer contains a number of standard Workbench preferences files which are used by the CD32-Startup script when it is executed after Workbench has started to reset the preferences to their default settings

Your Notes

Appendix A
Mount Files

To access devices attached to your Amiga, the operating system must be informed of their presence, there are several ways of doing this, but the most important is by using a mount file placed in the Devs/DOSDrivers drawer.

A mount file represents a device, handler, or file system; standard Amiga devices have their own mount files with icons in the DOSDrivers drawer in DEVS:. These are mounted automatically during the standard Startup-sequence,

Mount files consist of a list of keywords and values, for example:

```
Device = squirrelscsi.device
```

Note that unlike AmigaDOS file names the keyword values in mount files *are case sensitive*;: SquirrelSCSI.Device and SQUIRRELSCSI.DEVICE for example *do not* refer to the save device as squirrelscsi.device.

The keywords in a mount file describe the device, handler or file system which is to be mounted. Some keywords are only used for file systems and handlers.

A mount file is a plain ASCII file consisting of one keyword per line, separated by an equals sign, =, from a value. Comments may exist in a mount file using the C style (i.e. starting with a /* sequence and continuing through to a */). The name of mount file sets the name of the device that will be mounted (e.g. CD0).

If a mount file has an icon then the tool types (as set by the Workbench Info command) override any settings found in the mount file.

When creating a new mount file start with an existing one for the appropriate file system, handler or device; many of them require very few fields to be set up, or use constant values.

For SCSI devices attached to your SquirrelSCSI interface most mount files will have at least DEVICE=squirrelscsi.device and UNIT=<SCSI-ID> (with the specific exception of your first CD drive on an A1200 which will use DEVICE=cd.device and UNIT=0).

The following table lists the mount file keywords, their default values and the meaning of their value:

Keyword	Default	Value
Handler		A handler (e.g. L:port-handler)
EHandler		An environment handler.
FileSystem		A file system (e.g., L:CDFileSystem).
Device		A device entry (e.g. squirrelscsi.device) This argument is required to mount a file system.
Priority	10	The priority of the process
Unit	0	The unit number of the device.
Flags	0	Flags for OpenDevice (usually 0).
Surfaces		The number of surfaces (2 for floppy devices, varies for hard drives). This argument is required to mount a file system.
SectorsPerBlock		Defines the number of physical disk sectors in each logical block used by the file system.
SectorsPerTrack		The number of blocks per track. This argument is required to mount a file system.
SectorSize	512	Specifies the number of bytes in a block on the device. Most devices use a 512 byte block; however, some devices use other sizes (for example, CD-ROMs use 2048 bytes).
Reserved	2	The number of blocks reserved for the boot block; should be 2.
Interleave	0	Interleave value; varies with the device.
LowCyl		Starting cylinder to use. This argument is required to mount a file system.
HighCyl		Ending cylinder to use. This argument is required to mount a file system
Stacksize	600	Amount of stack allocated to the process.
Buffers	5	Number of initial 512-byte cache buffers.
BufMemType	3	Memory type used for buffers; (0 and 1 = Any, 2 and 3=Chip,4and5=Fast).
Mount	0	See ACTIVATE.
MaxTransfer	0x7fffffff	The maximum number of bytes transferred at one time with any file system. Use MaxTransfer for compatibility with older hard drive systems.
Mask	0xffffffff	Address Mask to specify memory range that DMA transfers can use at one time with any file system. Use Mask for compatibility with older hard drive systems.
Activate	0	If a positive value, ACTIVATE loads the device or handler immediately rather than waiting for first access. Synonymous with MOUNT.
DosType	0x444F5300	Indicates the type of file system, giving:
BootPri	0	A value that sets the boot priority of a bootable and mountable device. This value can range from -129 to 127. By convention, -129 indicates that the device is not bootable and is not automatically mounted.

Value	ASCII	File System
0x444F5300	DOS0	Original (OFS)
0x444F5301	DOS1	FastFileSystem (FFS)
0x444F5302	DOS2	International Mode OFS
0x444F5303	DOS3	International Mode FFS
0x444F5304	DOS4	Directory Caching International Mode OFS
0x444F5305	DOS5	Directory Caching International Mode FFS
0x4D534400	MSD0	MS-DOS

Startup		A string passed to the device, handler, or file system on startup.
GlobVec	2	A global vector for the process; -1 is no Global Vector (for C and assembler programs), 0 sets up a private Global Vector; if the keyword is absent, the shared Global Vector is used. Omit this keyword for Amiga file system devices.
Baud	1200	Serial device baud rate.
Control	0	Serial device word length, parity, and stop bits.
Forceload	0	Forces a file system to be loaded from disk even though a suitable entry is in the resource list. If 0 (the default), check the resource list before the disk. If 1, always load from disk.

Example Mount File and ToolTypes

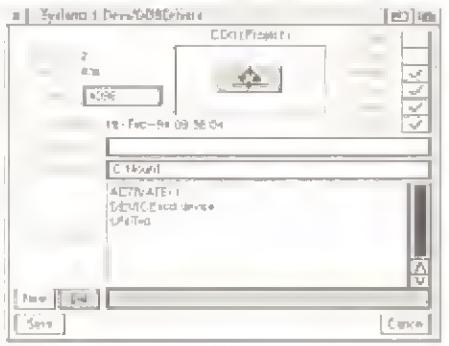
As an example mount file for a CDFileSystem based drive (e.g. CD0), this is the mount file which is used, together with its associated Workbench tool types.:

```
/* $VER: CD0 40.6 (31.8.93)
 *
 * CD-ROM file system entry
 *
 * This file enables the CD-ROM file system which allows you to read standard
 * ISO-9660 CD-ROM disks from an Amiga with a SCSI or IDE controller.
 *
 * The 'Unit' line defines the SCSI address of the CD-ROM drive. Drives
 * often come configured as unit 2, which is the default. Check the
 * documentation for your CD-ROM drive to find the exact SCSI address.
 * Note that most drives let you change this number using jumpers.
 */

FileSystem      = L:CDFileSystem
Flags           = 0
Surfaces        = 1
SectorsPerTrack = 1
SectorSize      = 2048
Mask            = 0x7ffffffe
MaxTransfer     = 0x100000
Reserved        = 0
Interleave      = 0
LowCyl          = 0
HighCyl         = 0
Buffers         = 5
BufMemType      = 0
StackSize       = 1000
Priority        = 10
GlobVec         = -1
DosType         = 0x43443031

/* The Device and Unit fields are controlled by tooltypes in the CD0 icon.
 *
 * Device       = scsi.device
 * Unit         = 2
 */
```

As the comments in the mount file indicate the device and unit are then set via the tool types:



CD0 ToolTypes via Workbench Info

Mount Lists

Some Amiga programs use the older style of MountList (which is nothing more than all the Mount Files for all partitions "glued" together), rather than a Mount File, in particular SCSIMounter may be used to generate a MountList for a drive which you are mounting.

To turn a MountList into a set of mount files, the separate parts can be cut out using a text editor and saved as separate text files using the partition name as the file name, for example, the mountlist:

```
/* Mountlist for partitions on drive ST3283A         7591    23 */

DH0:
        Device          = squirrelscsi.device
        Unit            = 0
        Flags           = 1
        Surfaces        = 14
        BlockSize       = 512
        BlocksPerTrack  = 35
        SectorsPerBlock = 1
        Reserved        = 2
        PreAlloc        = 0
        Interleave      = 0
        LowCyl          = 2
        HighCyl         = 35
        Buffers         = 30
        BufMemType      = 0
        MaxTransfer     = 0x00FFFFFF
        Mask            = 0xFFFFFFFE
        BootPri         = 1
        DosType         = 0x444F5303
#

DH1:
        Device          = squirrelscsi.device
        Unit            = 0
        Flags           = 0
        Surfaces        = 14
        BlockSize       = 512
        BlocksPerTrack  = 35
        SectorsPerBlock = 1
        Reserved        = 2
        PreAlloc        = 0
        Interleave      = 0
        LowCyl          = 36
        HighCyl         = 977
        Buffers         = 200
        BufMemType      = 0
        MaxTransfer     = 0x00FFFFFF
        Mask            = 0xFFFFFFFE
        BootPri         = 0
        DosType         = 0x444F5303
#
```


yields the two mount files:

(File saved as DEVS:DOSDrivers/DH0)

```
        Device          = squirrelscsi.device
        Unit            = 0
        Flags           = 1
        Surfaces        = 14
        BlockSize       = 512
        BlocksPerTrack  = 35
        SectorsPerBlock = 1
        Reserved        = 2
        PreAlloc        = 0
        Interleave      = 0
        LowCyl          = 2
        HighCyl         = 35
        Buffers         = 30
        BufMemType      = 0
        MaxTransfer     = 0x00FFFFFF
        Mask            = 0xFFFFFFFE
        BootPri         = 1
        DosType         = 0x444F5303
```

(File saved as DEVS:DOSDrivers/DH1)

```
        Device          = squirrelscsi.device
        Unit            = 0
        Flags           = 0
        Surfaces        = 14
        BlockSize       = 512
        BlocksPerTrack  = 35
        SectorsPerBlock = 1
        Reserved        = 2
        PreAlloc        = 0
        Interleave      = 0
        LowCyl          = 36
        HighCyl         = 977
        Buffers         = 200
        BufMemType      = 0
        MaxTransfer     = 0x00FFFFFF
        Mask            = 0xFFFFFFFE
        BootPri         = 0
        DosType         = 0x444F5303
```

Your Notes

Appendix B
The Supplied Software

The Surf Squirrel adapter comes with a number of utilities and drivers; many of the programs are not used directly, instead they work as part of the system software providing support for other programs.

The SquirrelSCSI installation places files into two distinct locations: onto your boot disk (SYS:), and into a folder on your Work disk (which will be the same as boot disk if working from floppy) into a CD32 folder.

Files in System Drawers

Files placed onto your boot disk are required either early on in the boot process (before any assigns are set up) or because they are updated versions of system files from earlier Workbench releases required for correct operation.

The Devs Drawer

The Devs drawer on your system boot disk contains a number of device drivers, these files are used by the system software to talk to hardware attached to your computer (such as a printer on an otherwise unexpanded machine); the Surf Squirrel installer adds a number of files to this drawer.

> Many of the files in the Devs drawer are invisible when viewed normally from the Workbench, this is because most users never need to interact directly with these programs.

squirrelscsi.device

This is the main device driver program, providing the functions required by other higher level software (whether user visible or not) in order to access the Surf Squirrel adapter hardware.

The only time a user will normally have to 'use' this program is in Mount files or SCSI drivers built in to the programs you use, where a "device name" is required; the Surf Squirrel device name is:

`squirrelscsi.device`

note that device names are case dependent, SquirrelSCSI.Device is *not* the same name and will not work correctly.

cd.device

This device provides the essential functionality required by a CD^{32} title when running on an A1200. This device also requires squirrelscsi.device to be present in the Devs drawer (cd.device is built on top of squirrelscsi.device).

> cd.device cannot emulate all features of the CD^{32}, in particular if a title uses CD^{32} specific hardware directly, or makes assumptions about the machine configuration (such as available RAM etc.) then the title may fail to work correctly.

Note that cd.device only emulates a CD^{32}, not a CDTV, and a surprising number of CD^{32} specific titles require a CDTV emulator (which the CD^{32} has built in).

cd.device.config

cd.device.config is a two line text file containing the device name (squirrelscsi.device) and the SCSI ID number of the CD-ROM drive which the CD^{32} should use. You will not normally need to edit this file since the supplied preference editor CDDevice (discussed elsewhere) can be used to perform the job automatically.

squirrelserial.device

This is the serial device driver program for the Surf Squirrel serial port.

The Devs/DOSDrivers drawer

The Devs/DOSDrivers drawer contains 'Mount files' which are used by the system to provide additional drives (for example PC0, the Amiga's MS-DOS floppy drive).

CD0

The CD0 mount file is used to mount a CD-ROM drive connected to your SquirrelSCSI interface.

Normally the device will be mounted as part of the system startup, if you wish to disable it for any reason you can do so by moving the CD0 icon from the Devs/DOSDrivers drawer to the Devs/Storage drawer.

Note that the UNIT field shown in the tool-types of this icon should normally be left as 0, regardless of which SCSI ID you CD-ROM drive is set to. If you change the SCSI ID of your CD-ROM drive you should run the CDDevice preferences editor to reflect the change.

The L drawer

The L drawer (not normally visible from the Workbench) contains programs which allow AmigaDOS to work with the files on the devices attached to your Amiga.

CDFileSystem

This file is Commodore's implementation of the ISO9660 standard file system, providing the support required for CD-ROMs attached to the Amiga. It is normally referenced from the CD0 Mount file found in the Devs/DOSDrivers drawer.

The Libs Drawer

The Libs drawer (not normally visible from the Workbench) contains libraries of routines which are required by the programs you run.

nonvolatile.library

The nonvolatile library provides support required by CD^{32} titles for saving information into a folder on your disk. The location of this directory is specified by the file SYS:l'refs/Env-Archive/Sys/nv_location; normally this will contain a single line such as Workbench:nonvolatile (to indicate the folder nonvolatile at the top level of your Workbench disk). Note that the path name must not be an assign such as SYS:, otherwise the CD^{32} would attempt to save its data to the top level of the CD drive!

lowlevel.library

The lowlevel library provides support for CD^{32} titles when performing operations such as working out the joystick position.

freeanim.library

The freeanim library is used on a CD^{32} to 'take down' the startup animation. It does nothing in the CD^{32} emulation, other than be present as a placebo for titles which expect to find it!

The C Drawer

The C drawer contains AmigaDOS shell commands, one additional Commodore supplied file is placed in this drawer by the installation process.

LoadResource

NAME/M,LOCK/S,UNLOCK/S

LoadResource is used to pre-load resources (libraries, devices, fonts and catalogues) into memory, either to reduce disk swaps (on floppy only systems), or with the LOCK option to prevent them being removed from memory to make additional space.

The NAME option specifies the paths of the resources to be loaded. The LOCK option tells the command to lock the resources into memory, preventing the system from flushing them from RAM if memory is low (note that devices cannot be locked in memory). The UNLOCK option tells LoadResource to unlock the resource allowing it to be flushed from RAM if the memory is required.

Entering LoadResource without any options lists all the locked resources in RAM.

The ENVARC: drawer

The ENVARC: drawer (SYS:Prefs/Env-Archive) contains environment variable settings which are preserved across reboots. The SquirrelSCSI installation adds one file to this drawer, CD32-Path.

CD32-Path

ENVARC:CD32-Path is a one line text file which describes the location of the CD32: drawer; it will normally be set up by the installation process to point to the drawer which contains the CD^{32} emulator files (e.g. Work:CD32).

If you move the location of this drawer you *must* update this file otherwise the CD32-Startup script will not be able to find the necessary files.

> The CD32-Startup script is invoked before your User-Startup script, hence the necessary assign can't be performed from the User-Startup. Rather than require you to edit a 'system' file (i.e. CD32-Startup) a permanent environment variable is used.

The S Drawer

The S drawer contains your normal Amiga startup scripts (such as Startup-Sequence and User-Startup); the SquirrelSCSI installation software adds an additional script to this drawer.

CD32-Startup

The CD32-Startup script is used to control starting a CD^{32} title after your normal Startup-Sequence has started running; like the Startup-Sequence script you should never need to modify this script.

The CD32-Startup script refers to many of the programs, files and drawers covered in this section, the most vital of which is ENVARC:CD32-Path; this file tells the CD32-Startup script the location of the other programs, files and drawers. If you ever move this folder, you *must* update the ENVARC:CD32-Path file to reflect the new location.

Files in the CD32 Drawer

The CD32 drawer contains all the files needed for configuring the CD32 emulator; many are only ever referenced by the CD32-Startup script.

The CD32:C Drawer

The C drawer (not normally visible from the Workbench) stores non-internal AmigaDOS commands. The Surf Squirrel installer adds a number of additional files to this directory which are used by the CD32-Startup script when attempting to boot a CD^{32} or CDTV title.

CDConfig

DEVICE/K,UNIT/N/K,
ATTENUATE/N/K,
PLAYSPEED/N/K,READSPEED/N/K,READXLSPEED/N/K,
SECTORSIZE/N/K,
XLECC/S,NOXLECC/S,
EJECTRESET/S,NOEJECTRESET/S,
PAUSE/S,NOPAUSE/S,
NORMAL/S,FFWD/S,FREV/S

CDConfig is used to set the internal options of the CD^{32} emulator, cd.device. Its primary use is for establishing the default cd.device setup prior to starting a CD^{32} title.

The DEVICE and UNIT options are used to specify the device and unit of the CD drive, in practice these options are almost never used, the defaults of cd.device and unit 0 sufficing. The ATTENUATE option instructs the command to alter the volume setting of the CD drive, 0 is fully attenuated, 32767 is maximum volume.

The PLAYSPEED, READSPEED and READXLSPEED options set the CD rate for the various forms of data managed by the CD, all are specified in frames per second (where 75 frames per second is the standard single-speed CD drive setting). SECTORSIZE controls the amount of data passed by the CD drive to the computer for each CD frame.

XLECC and NOXLECC are used to enable and disable error correction when CDXL animations are being played; since SCSI CD drives perform error correction in hardware these options will have no effect on the performance of animation playback.

EJECTRESET and NOEJECTRESET control whether the machine should be rebooted when a CD^{32} title is ejected from the drive; the default cd.device emulator behaviour is to not reset the Amiga on disc ejection, whereas a CD^{32} normally does reset, hence the EJECTRESET option is normally used as part of the CD32-Startup script.

PAUS E and NOPAUSE control the audio play/pause control. NORMAL, FFWD and FREV set the search setting of audio play operations (normal, fast-forward or fast-reverse).

CloseWorkbench

CLOSE/S,LOCK/S,UNLOCK/S

CloseWorkbench is used to close the workbench screen as part of starting a CD^{32} title and, optionally, prevent it from re-opening.

The CLOSE option tells CloseWorkbench that it should close the screen, this option is normally used. The LOCK option tells the command to prevent the system from re-opening the workbench screen unless absolutely required (for example if a program attempts to open a window on the screen). The UNLOCK option undoes the actions of the LOCK option and restores normal system behaviour.

FindTask

TASK=PROCESS/A

FindTask searches the Amiga's list active tasks and processes trying to locate the named task. If the task is found a status of OK is returned, if not a status of WARN is returned.

This command is used by the CD32-Startup script to detect the presence of the Amiga's preferences program IPrefs (which has the curious task name of "« IPrefs »").

ResetVBR

ResetVBR is used by some of the per-title CD32 setup scripts to ensure a special area of memory used by the processor is located at the bottom of Chip RAM.

ResolveDeviceName

DEVICE/A

ResolveDeviceName is used to turn a device name (such as DF0:, CD0: etc.) into the label attached to the currently mounted disk, or if no disk is mounted a status of WARN is returned.

This command is used by the CD32-Startup script to detect if a CD is present at system boot time and to allow additional scripts to be executed on a per-title basis.

SquirrelCD

DEVICE/K,AUDIOCONTROL/S,NOAUDIOCONTROL/S, MAXSPEED/N/K

SquirrelCD is used by some of the per-title CD32 setup scripts to disable certain features of the cd.device emulator which can cause problems with the title.

The DEVICE option, if specified, is used to set a device name other than cd.device.

The AUDIOCONTROL and NOAUDIOCONTROL switches control the operation of CD audio commands (such as playing a track, adjusting the volume etc.). If NOAUDIOCONTROL is specified then the CD32 emulator will not attempt to inform any programs of changes in audio status until the program explicitly requests it; if this option is required by a title then the behaviour of the title will usually be to mysteriously stop, but with CD audio still playing.

The MAXSPEED option is used to reconfigure the maximum speed that a drive reports it is capable of, like the CDConfig options it is also specified in frames per second.

SquirrelSCSI

DEVICE/K,POLLINTERVAL/N/K

SquirrelSCSI is used to set options for the SquirrelSCSI device driver.

The DEVICE option, if specified, is used to set a device name other than squirrelscsi.device.

The POLLINTERVAL option sets the time, in seconds, between each check the device driver makes to ascertain if a disk or cartridge has been removed from a removable device; the default setting is 3s. Alternatively a value of 0 may be set which disables media change detection (required for some CD^{32} titles) where after explicit DiskChange AmigaDOS commands are required.

WarnIfNotPAL

WarnIfNotPAL returns a status of WARN if the Amiga is not running in a PAL resolution, it is used by the CD32-Startup script when started from Workbench to allow the video display mode to be reset correctly.

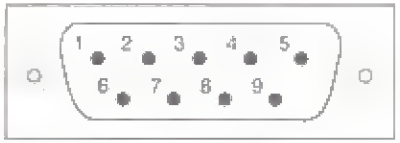
Extra Software

There may be extra disks supplied with the Surf Squirrel containing bonus PD programs. If so, there will be an instalation program and a ReadMe file on the first of these disks - please read the ReadMe file and then use the installation program to copy the programs that you want. Documentation will be included on disk.

Your Notes

Appendix C
Fast Serial Pinout

The Surf Squirrel Interface has two connections at the rear of the interface; on the left (looking from the front) is the SCSI cable for hard drives, CD-ROMs etc. while on the right is the fast serial port. This is a 9-pin D-type plug which looks like:



The Surf Squirrel serial port - as you look at it

Often, you will use this port to connect your Amiga to a modem in which case you will need a standard 9-way to 25-way modem cable (often supplied with the modem). This can simply be plugged into the Surf Squirrel (being careful not to dislodge the interface if connected to your Amiga) and into your modem.

However, you may wish to use this serial port for other applications (such as networking) and it will be useful to know the pinout of the port.

pin 1	DCD	Data Carrier Detect
pin 2	RXD	Receive Data
pin 3	TXD	Transmit Data
pin 4	DTR	Data Terminal Ready
pin 5	GND	Ground (earth)
pin 6	DSR	Data Set Ready
pin 7	RTS	Request To Send
pin 8	CTS	Clear To Send
pin 9	RI	Ring Indicator

The Surf Squirrel serial port - the pinout

If you intend to use this port for a non-standard application, you should refer to a good book on serial hardware/software for more information on the above pins and how to use them.

Appendix D
Technical Support

The Surf Squirrel Interface comes with 30 days free technical support, starting from the date of registration; therefore you should send in your registration card quickly. Technical support is available by telephone during our Technical Support Hour, by letter or by fax.

Should you wish to receive extended technical support, please complete the relevant sections on the registration card, indicating whether you would like to take up the Silver or the Gold service.

In addition to your name, address and postcode (very important for UK customers), we need payment details before we can accept your extended registration. You can pay by credit card (Mastercard, Eurocard, Access, Visa etc.), UK debit card (Switch, Connect etc.), Eurocheque, UK cheque or Postal Order.

You may have already registered another HiSoft product under our Gold or Silver service; in this case, there is no need to fill out the payment section.

Surf Squirrel Manual Addendum 2 May 1996

Please replace pages 19 and 20 in your Surf Squirrel manual and insert page 20a - these relate to the setup and use of a bootable external SCSI hard disk.

Additional Note

If you owned a Classic Squirrel interface previously and you are replacing it with a Surf Squirrel, please run the *DeleteClassicSquirrel* program (to be found in the root of the Surf Squirrel Master Disk) before installing Surf Squirrel. This program removes the older Squirrel driver from your system.

If you have any problems, please call our technical support line (01525 718181) between 2pm and 3pm daily.

HiSoft Systems, Greenfield, UK.

Building a CD32 boot floppy disk for the A1200 with CD ROM Drive

For this configuration choose the third option ("Create CD/CD32 boot floppy"). This option creates a bootable floppy disk used to start a CD32 title and may be used whether or not you have an internal hard disk.

This option formats a floppy disk and copies a number of files to it; the CD32 title may then be started by inserting a suitable CD into your CD drive and rebooting your machine with this boot disk in your floppy drive.

The SCSI ID of the CD-ROM drive is set using the CDDevice program (which is automatically started as part of the installation process).

Building a CD boot floppy for the A1200 with CD ROM Drive and no internal Hard Disk

For this machine configuration choose the fourth option ("Create CD only boot floppy"). This option creates a bootable floppy disk which mounts CD0, used for accessing CD discs.

This option formats a floppy disk and copies a number of files to it; the CD drive may be accessed by rebooting your machine with this boot disk in your floppy drive and then inserting a suitable CD in the CD-ROM drive.

Prior to using the CD file system you will need to modify the UNIT= tool type in the CD0 icon to reflect the SCSI ID number of your CD-ROM drive. The CD0 file is found in the Devs/DOSDrivers drawer of the boot disk which this installation creates.

Preparing an external SCSI Hard Disk with no Internal Hard Disk

For this machine configuration a considerable amount of setup is required to successfully build a bootable external hard disk., but the end result is definitely worth the struggle!

- Boot your machine with the backup of the Surf Squirrel SCSI master disk and open it by double-clicking the disk icon.
- Open the Tools drawer and run SquirrelHDToolBox; using this program, prep and partition your hard drive as described in the ***Preparing a Hard Disk with HDToolBox*** section.

Prep the Hard Drive

- Essentially this involves clicking *Change Drive Type, Define New, Read Configuration, Continue,* choosing a *Filename* for the config file (check the floppy is un-protected or use ram:x), *Ok, Ok.*

Partition the Hard Drive

- Click on *Partition Drive,* use the slider to adjust the size of your partitions (we would normally recommend a 10Mb partition for Workbench and the rest for your Work files), click *OK, Save Changes to Drive* and *Exit.*

- When you exit HDToolBox your Amiga will reboot; leave the Surf Squirrel master disk in the floppy drive so that the Amiga boots from the floppy.

Format the Hard Drive

- Once your A1200 has re-booted, two new icons will appear on your Workbench - these are the hard drive partitions; don't worry about their names at the moment, we are about to re-name them.

- Open the System drawer within the Surf Squirrel master disk and run the *Format* program; select one of the partitions which you have created, name it, and format it (a *Quick Format* is all that is required). You will need to perform this operation for every partition you have created. The partition which you intend to install the system software onto must be given the name *Workbench* when formatting. We would recommend that at least one of the other partitions is named *Work.*

Copy your Workbench to the Hard Disk

- Run the Surf Squirrel installation program and select the *Setup a SCSI hard disk for use with a boot disk* option. This option will ask you to select the partition to copy the Workbench files to, select the partition you named *Workbench.* The installation process will then ask you for each of your Commodore/Amiga Technologies supplied Workbench disks so that it may copy them to your external hard disk.

Create a Boot Floppy

- Run the Surf Squirrel installation program again and select the *Create Surf Squirrel hard disk boot floppy* option. This will create an autoboot floppy for use with your hard disk (i.e. a disk which will load the autobooting driver into memory so that the Amiga can control the external hard disk see the Autobooting section). Have a blank floppy disk ready, with a disk label on it *(Surf Squirrel Autoboot).*

Now you're ready! Remove all the floppy disks from your Amiga, turn the machine off for at least 1 minute (to ensure that the memory is cleared) and then insert your Surf Squirrel Autoboot floppy and power-up your A1200; it should boot briefly from the floppy disk and then from the SCSI hard disk.

Finally ...

- Now remove the autoboot floppy, re-insert your Surf Squirrel Master Disk (your backup copy, of course), run the Surf Squirrel installation program again and choose option 1 and, optionally, option 2 to install the Surf Squirrel serial driver and CD-ROM support to your external hard disk.